23-261

TRANSCRIPT OF RECORD.

SUPREME COURT OF THE UNITED STATES.

No. ~~377~~. 97

WILLIAM MASON, APPELLANT,

vs.

EDMUND H. GRAHAM AND WANTONROUSE.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE DISTRICT OF MASSACHUSETTS.

FILED DECEMBER 20, 1872.

DEC 1874

SUPREME COURT OF THE UNITED STATES.

No. 377.

WILLIAM MASON, APPELLANT,

vs.

EDMUND H. GRAHAM AND WANTON ROUSE.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE DISTRICT OF MASSACHUSETTS.

INDEX.

	Original.	Print.
Bill of complaint	6	1
Answer	12	3
Replication	15	5
Decree	16	6
Petition for rehearing	18	6
Affidavit of William Mason	21	7
W. W. Dutcher	23	8
Diagram	29	10
Isaac R. Scott	32	10
George Draper	38	12
Petition for rehearing denied	41	13
Master's report	41	15
Defendant's exceptions	55	17
Complainant's exceptions	58	18
Final decree	59	18
Appeal	61	19
Evidence for complainants	62	19
Evidence for defendant	116	50
Certificate of clerk circuit court	150	70
Copy of bond	151	70

4 UNITED STATES OF AMERICA,
Massachusetts District, ss:

At a circuit court of the United States for the first circuit, begun and holden at Boston, within and for the district of Massachusetts, on Monday, the sixteenth day of October, in the year of our Lord one thousand eight hundred and seventy-one, (the fifteenth day of said October happening on a Sunday.) Before the honorable George F. Shepley, circuit judge.

EDMUND H. GRAHAM ET AL., COMPLAINANTS,
v.
WILLIAM MASON, DEFENDANT. } In equity.

5 The bill of complaint in this cause was filed in the clerk's office on the eighth day of June, A. D. 1867, and was duly entered at the May term of this court, A. D. 1867, and is in the words and figures following, namely:

6 *Bill of Complaint.*

To the honorable the justices of the circuit court of the United States, for the first circuit, within and for the district of Massachusetts, sitting in equity:

Edmund H. Graham, of Manchester, in the State of New Hampshire, and Wanton Rouse, of Taunton, in the State of Massachusetts, both citizens of the United States, bring this their bill against William Mason, of said Taunton, manufacturer.

And thereupon your orators complain and say that your orator, said Edmund H. Graham, then of said Manchester, and a citizen of the United States, was, on and before the sixteenth day of October, in the year 1860, the original and first inventor of a new and useful improvement in picker-staff motion for looms, which was not known or used before said Graham's invention thereof; that the said Graham, the said invention not having been at the time in public use or on sale with his consent or allowance for more than two years, did make application to the Government of the United States for their letters-patent for the said improvement; and thereupon, to wit, on the said sixteenth day of October, in the year 1860, said letters-patent bearing said date, signed by the Secretary of the Interior, and countersigned and sealed with the seal of the Patent-Office, by the Commissioner of Patents, did issue to the said Edmund H. Graham, granting to him, his heirs, administrators, and assigns, for the term of fourteen years from the date thereof,
7 the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, as by the re-issue of the said letters-patent to be presently referred to, and now produced and shown to your honors, will more fully appear.

And your orators further show unto your honors, that afterwards, to wit, before the sixth day of February, in the year 1861, the said Edmund H. Graham, by his written instrument of assignment of that date, duly recorded in the United States Patent-Office, assigned, sold, set over, and conveyed unto your orator, Wanton Rouse, one undivided half part of all right, title, and interest in and to said invention and letters-patent; all which, by said instrument of assignment, and by the certificate of the recording thereof thereon endorsed, now produced and shown to your honors, will more fully appear.

4 UNITED STATES OF AMERICA,
Massachusetts District, ss:

At a circuit court of the United States for the first circuit, begun and holden at Boston, within and for the district of Massachusetts, on Monday, the sixteenth day of October, in the year of our Lord one thousand eight hundred and seventy-one, (the fifteenth day of said October happening on a Sunday.) Before the honorable George F. Shepley, circuit judge.

EDMUND H. GRAHAM ET AL., COMPLAINANTS,
v.
WILLIAM MASON, DEFENDANT. } In equity.

5 The bill of complaint in this cause was filed in the clerk's office on the eighth day of June, A. D. 1867, and was duly entered at the May term of this court, A. D. 1867, and is in the words and figures following, namely:

6 *Bill of Complaint.*

To the honorable the justices of the circuit court of the United States, for the first circuit, within and for the district of Massachusetts, sitting in equity:

Edmund H. Graham, of Manchester, in the State of New Hampshire, and Wanton Rouse, of Taunton, in the State of Massachusetts, both citizens of the United States, bring this their bill against William Mason, of said Taunton, manufacturer.

And thereupon your orators complain and say that your orator, said Edmund H. Graham, then of said Manchester, and a citizen of the United States, was, on and before the sixteenth day of October, in the year 1860, the original and first inventor of a new and useful improvement in picker-staff motion for looms, which was not known or used before said Graham's invention thereof; that the said Graham, the said invention not having been at the time in public use or on sale with his consent or allowance for more than two years, did make application to the Government of the United States for their letters-patent for the said improvement; and thereupon, to wit, on the said sixteenth day of October, in the year 1860, said letters-patent bearing said date, signed by the Secretary of the Interior, and countersigned and sealed with the seal of the Patent-Office, by the Commissioner of Patents, did issue to the said Edmund H. Graham, granting to him, his heirs, administrators, and assigns, for the term of fourteen years from the date thereof,
7 the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, as by the re-issue of the said letters-patent to be presently referred to, and now produced and shown to your honors, will more fully appear.

And your orators further show unto your honors, that afterwards, to wit, before the sixth day of February, in the year 1861, the said Edmund H. Graham, by his written instrument of assignment of that date, duly recorded in the United States Patent-Office, assigned, sold, set over, and conveyed unto your orator, Wanton Rouse, one undivided half part of all right, title, and interest in and to said invention and letters-patent; all which, by said instrument of assignment, and by the certificate of the recording thereof thereon endorsed, now produced and shown to your honors, will more fully appear.

And your orators further show unto your honors that afterwards, to wit, before the second day of October, in the year 1866, the said letters-patent, being believed by your orators to be inoperative or invalid, by reason of a defective specification, were surrendered according to law and cancelled, and new letters-patent, bearing date said second day of October, did issue for the same invention and on an amended specification, whereby there were vested in your orators the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, all which, by the re-issue of the said letters-patent, now produced and shown to your honors, will more fully appear.

And your orators further show unto your honors that afterwards, to wit, before the twenty-eighth day of May, in the year 1867, the said letters-patent being believed by your orators to be inoperative or invalid by reason of a defective specification, were surrendered according to law and cancelled, and new letters-patent, bearing date said twenty-eighth day of May, did issue for the same invention, and on an amended specification, whereby there were vested in your orators the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, all which, by the said re-issued letters-patent, now produced and shown to your honors, will more fully appear.

8 And your orators farther show unto your honors that they have always, in the exercise of the full and exclusive right and liberty so granted as aforesaid, made, sold, and used the improvement so patented; and have had and maintained, until the infringement hereinafter complained of, exclusive possesssion of said improvement and invention, under and by virtue of said letters-patent, and have never acquiesced in any invasion or infringement of their said rights.

And your orators farther show unto your honors that the respondent herein, having full knowledge of the premises, and in violation of your orators' exclusive right and privilege, as aforesaid, and utterly disregarding the same, has, since the date of the said re-issued letters-patent, without the license of your orators, at Taunton, in said district, and various other places in the United States, manufactured, used, and sold, and still continues to manufacture, use, and sell, picker-staff motions for looms, embracing the improvement so secured to your orators, in large numbers; but how many your orators are unable to set forth; but they pray that the respondent may discover and set forth in answer to this bill.

And your orators farther show unto your honors that they will be subject to great and irreparable injury unless they shall obtain from your honors the relief hereby sought.

To the end, therefore, that the said respondent may, but not upon his corporal oath, which is hereby waived, full, true, direct, and perfect answer make to all and singular the matters hereinbefore stated and charged, as fully and particularly as if the same were hereinafter repeated, and be thereunto distinctly interrogated, according to the best of his knowledge, information, and belief, and more especially that he may answer and set forth—

1. Whether he has not, since the second day of October, in the year 1866, manufactured two kinds of picker-staff motions; and, if not, how many kinds he has manufactured, and how many of each kind;

2. Whether, in all such picker-staff motions, there was not a rocker, to which the picker-staff was secured, which rocker rested upon a bed, which bed was so constrbcted as to be secured to the proper part of

the loom in which such picker-staff motion was to be used; and whether in all such picker-staff motions such rockers were not secured
9 to such beds by means of journals projecting each side of the picker-staff, and arranged beneath it. And, if not, state fully and particularly how such rockers were secured to such beds;

3. Whether the boxes or bearings in which such journals were placed were not made open—that is, with a space wide enough to allow the journals to be placed in them from the top; and, if so, how many of such picker-staff motions were made; and, if not, state fully and particularly how such boxes or bearings were made;

4. Whether, in all such motions, the journals were not upon an arm; and, if not, how otherwise;

And that the said respondent may answer the premises, and that he may be decreed to account for and pay over to your orators all such gains and profits as have accrued to him from the manufacture, use, and sale of such picker-staff motions, and that he may be restrained by an injunction issuing out of this honorable court from making, using, or vending to others to be used, any, all, or more of said picker-staff motions, embracing, substantially and in principle, the same construction and mode of operation as the new and useful improvement secured to your orators, as aforesaid, and that the said picker-staff motions, now in the possession of the respondent, may be destroyed or delivered up to your orators, and that the respondents pay to your orators the damages by them most wrongfully sustained, and for such other and farther relief as to your honors may seem meet, and the nature of the case may require:

May it please your honors to grant unto your orators, not only a writ of injunction conformable to the prayer of this bill, but also the writ of subpœna directed to the said William Mason, commanding him to appear and answer to this bill of complaint, and to do and receive what to your honors shall seem meet.

And your orators will ever pray.

EDMUND H. GRAHAM
WANTON ROUSE,
By their solicitor, J. E. MAYNADIER.

J. E. MAYNADIER,
Solicitor and of Counsel.

10 This cause was thence continued to the October term of this court, A. D. 1867, when, to wit, October 28th, 1867, the following answer was filed, namely:

11

12 *Answer.*

The answer of William Mason, respondent, to the bill of complaint of Edward H. Graham and Wanton Rouse, complainants.

This respondent now, and at all times, reserving to himself all manner of benefit and advantage of exception that can or may be taken to the manifold errors, insufficiencies, and imperfections in the said bill of complaint contained, for answer thereunto, or to so much thereof as he is advised it is material for him to answer unto, answering, admits that letters-patent of the United States were granted to Edmund H. Gra-

ham, on the 16th day of October, 1860, for an alleged improvement in the picker-staff motion for looms.

And this respondent, further answering, says that he has no knowledge of any assignment of any interest in the said letters-patent to the said Wanton Rouse, as recited in the said bill of complaint, and leaves the plaintiffs to make proof thereof as they may be advised.

And this respondent, further answering on information and belief, admits that the said letters-patent were surrendered and other letters-patent granted on the 2d day of October, 1866, but this respondent, on information and belief, denies that the said original letters-patent were surrendered, as averred in the bill of complaint, by reason of a defective or insufficient specification, and charges the fact to be that the said letters-patent were surrendered and re-issued as aforesaid to claim as the invention of the said Edmund H. Graham what was not invented
13 by him, and with a view to claim what was not intended to have been patented by him in the said original letters-patent so as aforesaid surrendered.

And this respondent, further answering on information and belief, admits that the said re-issued letters-patent, bearing date, as aforesaid, the 2d day of October, 1866, were surrendered and cancelled, and that new and re-issued letters-patent were granted to these complainants for the unexpired term for which the before-recited original letters-patent were granted on the 16th day of October, 1860, which said last re-issued letters-patent bear date the 28th day of May, 1867. But this respondent, on information and belief, denies that the said re-issued letters-patent, dated the 2d day of October, 1866, were surrendered by reason of an insufficient description and specification, and charges the fact to be that the said last re-issue was applied for and obtained with a view to claim, as the invention of the said Edmund H. Graham, what was never invented by him, and which the said Graham did not intend to patent in and by the said original letters-patent, granted, as aforesaid, on the 16th day of October, 1860.

And this respondent, further answering, denies that he has at any time, before or since the grant of the said original letters-patent, on the 16th day of October, 1860, and especially since the grant of the said last re-issued letters-patent on the 28th day of May, 1867, made, used, and sold, or caused to be made, used, or sold, any picker-staff motions, in semblance or imitation of, or in any manner substantially like, anything described and claimed as the invention of the said Graham in the said re-issued letters patent, dated, as aforesaid, on or about the 28th of May, 1867, and recited in the bill of complaint.

And this respondent, further answering, admits that he has for several years past, and still continues to make and sell, at Taunton, in the State of Massachusetts, picker-staff motions for looms, and looms with such picker-staff motions, and that he has done so with the knowledge of these complainants, and with the conviction, that by so doing, he was not in any manner infringing upon the legal rights of these complainants or any other person.

And this respondent, further answering, says, on information
14 and belief, that if the claims of invention in the specification of the said last re-issued letters-patent, bearing date 28th day of May, 1867, in the bill of complaint recited, shall be so construed as to cover any device or combination found in any of the shuttle-motions heretofore made, used, or sold by this respondent, such device or combination so claimed, and each and every of them, were known and used before the alleged invention thereof, by the said Edmund H. Graham, and

that the following persons had knowledge of the prior use thereof at the places named, viz, Benjamin Lapham, at Waterford, Saratoga County, in the State of New York; Alvin Lyon, of Lawrence, in the State of Massachusetts, at the said place; Elisha Robbins, of Milford, in the State of Massachusetts, at the said place; William Stearns, of Manchester, in the State of New Hampshire, at that place; and John L. Cheney, of Lowell, in the State of Massachusetts, at that place; and were also described in letters-patent, granted in the United States, long prior to the grant of the said original letters-patent, dated the 16th day of October, 1860, and first recited in the bill of complaint, and prior to the alleged invention of the said Edmund H. Graham; namely, in the letters-patent, No. 575, granted to Benjamin Lapham, bearing date the 28th day of January, 1838, and entitled for "improvement in power-looms;" letters-patent, No. 24668, granted to William Stearns, bearing date the 5th day of July, 1859, and entitled for "improvement in the picker-motion for power-looms;" letters-patent, No. 16824, granted to John L. Cheney, and bearing date March 17th, 1857, and entitled for "improvement in power-looms;" and in letters-patent, No. 3968, granted to Daniel Barnum, bearing date the 26th day of March,.1845, and entitled for "improvement in power-looms."

Wherefore, and for all the causes aforesaid, this respondent wholly denies the equity of the complainants' said bill, and their title to the relief prayed against this respondent.

This respondent denies that there is any other matter, cause, or thing in the complainants' said bill of complaint contained, material or necessary to make answer unto, and not herein and hereby well and sufficiently answered, confessed, traversed, avoided, or denied, that is true to the knowledge or belief of this respondent; all which matters and things this respondent is ready and willing to aver, maintain, and prove as this honorable court shall direct, and humbly prays to be hence dismissed with his reasonable costs and charges in this behalf most wrongfully sustained.

WILLIAM MASON.

CHARLES M. KELLER,
Of Counsel.

And on the fourth day of November, A. D. 1867, the following replication was filed, namely:

Replication.

The replication of Edmund H. Graham and another, complainants, to the answer of William Mason, respondent.

These repliants, saving and reserving unto themselves all and all manner of advantages of exception to the manifold insufficiencies of the said answer, for replication thereunto say that they will aver and prove their said bill to be true, certain, and sufficient in the law to be answered unto; and that the said answer of the respondent is uncertain, untrue, and insufficient to be replied unto by these repliants, without this, that any other matter or thing whatsoever in the said answer contained, material or effectual in the law to be replied unto, confessed and avoided, traversed or denied, is true; all which matters and things these repliants are and will be ready to aver, maintain, and prove, as this honorable court shall direct, and humbly pray, as in and by their said bill they have already prayed.

By J. E. MAYNADIER,
Solicitor and of Counsel.

16 This cause was thence continued to the May term of this court, A. D. 1868, when, the honorable Nathan Clifford, associate justice, and the honorable John Lowell, district judge, holding said court, publication of the testimony was ordered, and the cause set down for hearing and fully heard. This cause was thence continued, from term to term, to the May term of this court, A. D. 1869, when, to wit, on the ninth day of June, the following decree was entered, namely:

Decree.

Upon final hearing of this cause, upon the pleadings and proofs, and after arguments of counsel on either side, and consideration by the court:

It is ordered, adjudged, and decreed, that the re-issue dated May 28th, 1867, of the letters-patent granted originally to the complainant Graham, Oct. 16th, 1860, and re-issued to the complainants, October 2d, 1866, being the re-issued patent on which this suit is founded,
17 is a good and valid patent, and that the complainant Graham was the original and first inventor of the improvements therein described and claimed, and that the respondent Mason has infringed upon said re-issued patent and upon the exclusive rights of the complainants thereunder; also, that the complainants recover of the respondent all gains and profits received or made by the respondent from his infringement of the said re-issued patent by the manufacture and sale of picker-staff motions, embracing said improvements or any part thereof, at any time since the 28th day of May, A. D. 1867; also, that the complainants recover their costs and charges and disbursements in this suit to be taxed; also, that it be referred to E. F. Hodges, esquire, one of the masters of this court, to ascertain, take, and state, and report to the court an account of the gains and profits received and made by the respondent as aforesaid; also, that the complainants, on said
18 accounting, have the right to cause an examination of said respondent ore tenus or otherwise, and the production of his books, vouchers, and documents; and that the respondent attend for such purpose before said master, from time to time, as said master shall direct; also, that a perpetual injunction be issued in this suit against the said respondent, according to the prayer of the bill.

This cause was thence continued, from term to term, to the May term of this court, A. D. 1870, when, to wit, June 7th, 1870, the following papers were filed, namely:

Petition for rehearing.

The defendant in the above-entitled suit respectfully represents to this honorable court that since the decree in the above-entitled cause and the grant of an injunction restraining this defendant from making, using, and vending picker-staff motions such as this defendant had made, used, and sold, and which were found by this honorable court to infringe the letters-patent recited in the bill of complaint,
19 this defendant has discovered evidence, which he is advised by his counsel, and which he verily believes would, if it had been produced at the trial, have satisfied this honorable court that this defendant was not an infringer of any legal right of the complainants.

And this defendant further represents to your honors that, at the time of the commencement of the said suit, he believed that such evidence could be procured, and made diligent search for it, but failed to find it;

that, after the service of the said injunction, he renewed his efforts, and finally succeeded in finding such evidence, and having obtained affidavits of persons who possess the knowledge of the prior use of picker-staff motions, which will, he verily believes, satisfy your honors that the complain't's letters-patent should be construed so narrowly as not to include the picker-staff motions made by this defendant, or that the said letters-patent are void.

This defendant, for the reasons above given, prays your honours to open the decree, and to grant a new trial in the above-entitled
20 cause, that your orator may have an opportunity of establishing the facts above stated.

And your orator will ever pray.

WM MASON.

KELLER & BLAKE,
Sol'. for Defendants.

U. S. OF A., *Mass. Dist.:*

JUNE 7TH, 1870.

Sworn to before me.

JOHN G. STETSON,
Notary Public.

Due service of the above admitted.

J. E. MAYNADIER,
Solic'r for Compl't.

Stipulation.

It is agreed that the petition for a rehearing, filed this 7th day of June, 1870, may be regarded as filed before the end of the October T., 1869.

J. E. MAYNADIER,
21 *Solic'r for Compl'ts.*
KELLER & BLAKE,
Sol. for Defendant.

Affidavit of William Mason.

William Mason deposes and says that he is the defendant in the above-entitled suit; that, at the time of the commencement of the said suit, deponent was satisfied that there was evidence to establish the fact that long prior to the date of complainant Graham's alleged invention picker-staff motions for looms were known and used in the United States, in which the rocker was connected with the bed by means of two parallel radius bars or links fitted to journals projecting from each side of the bed and from each side of the rocker; and, under this conviction, deponent made diligent search for such evidence, but failed to find it before the decision of the said case.

And deponent further says that so soon as he was enjoined in
22 the said suit he stopped making, using, and selling such picker-staff motions as he was making prior to the injunction, and from that time after made such only as he knew had been made and used prior to the date of complainant Graham's alleged invention.

And deponent further says that he was informed that complainant's counsel intended to move for an attachment for contempt of the injunc-

tion by making such picker-staff motions, as before stated, with two parallel radius bars to connect the rocker with the bed; and, being informed of such intention, deponent renewed his efforts, and finally found the required evidence and obtained affidavits of the parties who had knowledge of the use of such picker-staff motions, and when and where they were used.

WM MASON.

U. S. OF A., *Mass. Dist.:*

JUNE 7TH, 1870.

Sworn to before me.

JOHN G. STETSON,
Notary Public.

Affidavit of Warren W. Dutcher.

WARREN W. DUTCHER, being duly sworn, deposes and says that he is 57 years of age, and resides at Milford, Worcester Co., in the State of Massachusetts, and is at present a stockholder, director, and agent of the Dutcher Temple Company; he is also the general superintendent of the manufactory of that company, and has been conversant with power-looms for more than 30 years.

About the year 1833 I was working as boss-weaver at North Bennington, Vermont, and at that time one Benjamin Lapham came to the factory where I was employed to introduce a let-off motion for looms, which he said he had invented, and for which I subsequently purchased a State right; while there Lapham told me he was calculating to get up a shuttle-motion to throw a shuttle without a string, and get rid of the picker and picker-rod. This set me a thinking whether I could not ac-
24 complish the same result, and after thinking and experimenting, I finally got a plan completed, and got our Senator, Mr. Highland Hall, who was in Washington, to see if I could get a patent for it. I was informed that he submitted the matter to a Mr. Elliot, a patent agent in Washington, who sent me a sketch of a rocker-motion, which he said was described in Lapham's patent, and that this motion of Lapham's was as good as mine. This, as near as I can remember, was in the year 1840. Before I applied to Senator Hall I had looms in use with my shuttle-motion on them.

After receiving the sketch from Elliot I went to Waterford, New York, about 30 miles from Bennington, where I knew Lapham lived, to find out some more about his rocker-motion; while there I saw and examined several looms which were at work with his rocker-motion on them; this motion was like the sketch sent me by Elliott, which showed only the front of the rocker, but when I got to Waterford I found that the
25 looms at work there had another link on the back side of the rocker just like the link on the front side. The rocker had a pin put through it nearly under the picker-staff and projecting on each side of the rocker, and the rocker-bed had another pin put through that end of it furthest from the loom, which pin projected on each side of the bed; there were two links or swinging rods, each with two holes in them, one on each side of the rocker, and each with one hole in the rocker-pin and the other hole on the bed-pin. The picker-staffs were moved away from the loom by cams, and while they were moving away they extended a spiral spring attached at one end to the staff; this spring, when retracting, moved the staff to throw the shuttle. The rocker and bed and links

appeared to me to work very well, but I did not like the plan of throwing the shuttle by a spring.

When I got back again to Bennington, I put the Lapham mo-
26 tion on several looms, on some of them just as I saw it at Waterford, but in my looms the picker-staff was thrown away from the loom by a spring and towards the loom to throw the shuttle by a tappet. I should have said before that I was so well pleased with the Lapham rocker-motion that I tried to buy his patent, but as he died not long after I was at Waterford, I found I could not do so without considerable trouble with the heirs, so I concluded to go on with my own motion.

The looms I put the Lapham motion on at Bennington all worked well, but I liked best a modification I made of Lapham's in which I made the rocker-bed wider than Lapham's and the rocker wider than the bed; this rocker had two flanges projecting downwards, one on each side of the bed, and instead of the two links or rods and the two pins I used one link in shape like a flat staple, the piece of metal of which it was made being bent twice right angles. The two legs of the staple were round, and entered, the one into a hole in the rocker, the other into a
27 hole in the sword of the loom; and there were two pins passing through the ends of the staple to hold it in place. This plan is shewn in the right side of the rough sketch made by me and hereto annexed, the staple being shewn in a separate figure. The right-hand side of the sketch also shows how I applied the spring to draw the picker-staff away from the loom. I sometimes shifted the hole from the sword to the rocker-bed, and then one of the legs of the staple-shaped piece entered a hole in the bed which corresponded in place with the pin in Lapham's bed. I cannot remember the time when I made these motions, nor exactly how long they were running, but all the things I have spoken of occurred before the granting of my patent June 7th, 1846.

After running my motion and Lapham's, and my modification of Lapham, side by side long enough to test the matter, I became convinced that my motion was as good as Lapham's, if not better; and as it
28 was my interest to get my own invention into use, and as much as possible get Lapham's out of the way, I took all the Lapham motions and my modifications of them off the looms and substituting my own patented motion in place of them. I think I thus altered about a dozen looms. While the looms with my shuttle-motion and Lapham's rockers were at work at Bennington, some persons came up from Nathan Wild's mill at Valatia, near Kinderhook, New York, to see the shuttle-motions at work at Bennington, and I heard afterwards that looms were at work at Wild's with a rocker-motion. I went down several times to see them; they had a flanged rocker like my modification of Lapham, but had a leather strap lying between the rocker and the bed and attached to both.

Young Wild & a man by the name of Reynolds were the persons who came to see me and my looms at Bennington, and when I went to Valatia one Reynolds claimed to be the inventor of the strap arrangement;
29 his Christian name was Renssellaer, and he was the brother of the one who came to Bennington. The left-hand side of the sketch shews the rocker-motion as I saw it at Waterford, in front view.

WARREN W. DUTCHER.

U. S. OF AMERICA,
Dist. of Massachusetts, County of Suffolk:

At Boston, in said county, this eleventh day of November, A. D. 1869,

personally appeared the above-named Warren W. Dutcher, and made solemn oath that the foregoing affidavit by him subscribed is true.

Before me.

N. AUSTIN PARKS,
Notary Public.

(Here follows diagram marked page 29.)

(Pages 30 and 31, diagrams removed.)

32 *Affidavit of Isaac R. Scott.*

Isaac R. Scott, being duly sworn, deposes and says that he is 52 years of age, and resides at Waltham, in the State of Massachusetts; that he is now agent of the Boston Manufacturing Co., and has been so since 1863, and that prior to that time, from the year 1848, he was superintendent of the same company. Deponent further saith that early in the year 1856, he invented a contrivance for causing the upper end of a picker-staff of a loom to move in straight lines, and that said contrivance consisted of a bed attached to and projecting from the rocker-shaft of the lay, said bed being provided with two flanges projecting upwards; between these two flanges, and upon the bed, there rested a rocker like a cradle-rocker, and the picker-staff projected up from the middle of the rocker. A round pin was passed through a hole drilled crosswise of the rocker and projected in each side of it, and a similar pin passed through the end of the bed that was furthest from the loom. I
33 had also *ten* radius bars of wrought iron, each with a hole at each end. These two bars were slipped upon the pins, one on each side of the rocker, the two bars being parallel with each other, and both pivoted upon the ends of the same pin, both in the rocker and on the bed.

I made a model of this contrivance, and also applied it to a loom, and had it at work upon a loom, and then went to Washington to try and get a patent, returning from Washington April 11th, 1856. While at Washington I examined the models in the model-room, in company with some employee of the Patent-Office, and found a model just like mine, except that it had a radius bar on one side only. John Pike, of Boston, who, I believe, is still alive, was with me in Washington. I became satisfied that I could not get a patent because of this old model, and returned home. During the spring and summer of 1856 I applied my contrivance to several looms, I think about a dozen, and these looms,
34 with my contrivance upon them, were kept running at our works for several years.

During the spring of 1856 I conversed with Mr. Geo. Draper about my contrivance, and among other letters from his firm was one, a copy of which is hereto attached.

In 1859 these looms, with my contrivance attached, were still running, and I rec'd from Messrs. Draper another letter, referring to them, and replied to the same, copies of both letters being hereto attached. About this time we adopted the Perry motion for guiding picker-staffs, and found it to work very well. I cannot say when we took off my contrivances from the looms and replaced them by the Perry motion, but I thought the Perry-motion was as good or better than mine, and the Perry motion was finally put in about five hundred looms, viz: all the looms we used below 60 inches in width. We had about 100 looms over 60 inches, and to these we did not apply either the Perry motion

or my contrivance, for the reason that we could not apply either without great expense.

ISAAC R. SCOTT.

U. S. OF AMERICA,
Dist. of Massachusetts, County of Suffolk:

At Boston, in said county, this eleventh day of November, A. D. 1859, personally appeared the above-named Isaac R. Scott, and made solemn oath that the foregoing affidavit by him subscribed is true.

Before me.

[L. S.] N. AUSTIN PARKS,
Notary Public.

GEO. DRAPER. W'M F. DRAPER.

OFFICE OF GEORGE DRAPER & SON,
Hopedale, Mass., October 7, 1859.

Mr. J. R. SCOTT, *Sup't Boston M'f'g Co., Waltham, Mass.:*

DEAR SIR: Please send me a sketch of the manner in which you fixed rockers on to 3 looms you showed me a long time ago. You had a strip of iron about as thick as nail-plate, that extended from one end of the rockers to the other. One end was attached to the rocker at one end, and the other was attached to the bed the rocker played on. Please send soon, & when you do, let us know what you are doing about the shuttle-motions.

Yours, truly,

GEO., FOR E. D. & G. DRAPER.

A true copy. Attest:

[L. S.] N. AUSTIN PARKS,
Not'y Pub.

WALTHAM, *Oct.* 11, 1859.

Messrs. E. D. & G. DRAPER:

GENTS: Yours of the 7th came to hand last evening. The parallel motion to which you allude was made like this: The rocker is made of cast-iron about $\frac{5}{8}$ of an inch wide The bottom piece has flanges to keep the rocker in place side ways, and connected by two iron straps, to keep it from being drawn forward. The straps are $\frac{3}{4}$ & $\frac{1}{16}$ in. thick, connected by a $\frac{5}{16}$ in. pin for the bearing. We have concluded to adopt the Perry motion for 112 looms, and are now making the alteration; and if you want to see the best running loom out, you can do so by calling here.

Yours, truly,

J. R. SCOTT.

P. S. The above motion is not patentable, as a similar one was patented more than 20 years ago.

A true copy. Attest:

[L. S.] N. AUSTIN PARKS,
Notary Public.

HOPEDALE, MILFORD, *May* 2, '56.

Mr. J. R. SCOTT, *Sup't:*

DEAR SIR: Please send L. W. Carroll, Norwich, Conn., by expres
50 p'c's No. 1 revolving temples, without plates & bolts. Make the bi
at 90c. per pair, net. I have thought about your plan of holdin
38 the bottom of the picker-staff by a radius rod, while you make i
parallel by a rocker. I believe it would be considered an infringe
ment on Perry & Dutcher's patents, but we should not objecting t
your using it in some of your looms if we knew it to be so. I hope
you have sent those temples to the Uxbridge cott. mills. They wanted
them immediately.

Yours, truly,

GEO., FOR E. D. & G. DRAPER.

A true copy.
Attest:

E. D. BANCROFT.

Affidavit of George Draper.

GEORGE DRAPER, of Milford, Worcester Co., Massachusetts, being duly sworn, deposes and says, that he is the same George Draper who was examined in the above-entitled case, March 25th, 1868, and made an affidavit in the same case, sworn to on the 13th day of October, A. D. 1869.

39 Deponent further saith that since the date of the said affidavit he has thought a good deal about the various matters referred to in the above-entitled suit, and there came into his mind the idea that he had long ago seen a rocker motion with two radious bars, one on each side of the rocker and both pivoted at one end to the rocker and at the other to the bed; that he then recollected that he had seen such a contrivance at work in one or more looms at the mill of the Boston Manufacturing Company at Waltham, Mass., and then searched the letter-book of his firm to see if he could find anything which would serve to refresh his memory. During such search he found in the letter-book, which contains press copies of letters, two copies of letters from the firm of E. D. & G. Draper, and written by deponant, copies of which are attached to the affidavit made by Isaac R. Scott in the above-entitled case, and sworn to on this 11th day of November, 1868;

40 and deponent also discovered in the files of his firm an original letter from the said Scott, dated Octo. 11, 1859, a copy of which is attached to the same deposition; and deponant has examined all the copies so attached, and says the same are true copies of the original. Deponant has also heard read the affidavit, aforesaid, of Isaac R. Scott, and his recollections of the rocker motion used at Waltham agree in all respects with the description in that affidavit.

GEORGE DRAPER.

U. S. OF AMERICA,
Dist of Massachusetts, County of Suffolk:

At Boston, in said county, this eleventh day of November, A. D. 1869, personally appeared the above-named George Draper, and made solemn oath that the foregoing affidavit by him subscribed is true.

Before me.

N. AUSTIN PARKS,
Notary Public.

41 This cause thereupon came on to be further heard upon said petition for rehearing, and was argued by counsel, and after due deliberation thereon had by the court, the honorable Nathan Clifford, associate justice, and the honorable John Lowell, district judge, sitting together, the prayer of said petition was denied.

This cause was thence continued to the October term of this court, A. D. 1870, when, to wit, March 29th, 1871, the master made the following report, namely.

To the honorable judges of the circuit court for the district of Massachusetts.

In pursuance of a decretal order made in the above cause by this honorable court, I, the subscriber, one of the masters of this court, having been attended on several days by the said parties and their respective counsel, and having heard the testimony by them produced, and having examined said parties and their books and papers touching the matters and things by said order directed to be inquired into, and having

42 considered the same, do report: Since the date of the last re-issue of the plaintiff's letters-patent, May 28th, 1867, the defendant has manufactured two kinds of "parallel motions" or mechanisms for operating the "picker staves" of looms, viz, one called "bridle motions" and one called "double-link motions." The "bridle motion" is the same mechanism pronounced by the court to be an infringement of the plaintiff's patent in this case. The defendant abandoned the manufacture of this motion upon the issuing the injunction granted in this case.

An account of the profits resulting from this manufacture will be found in the schedule hereto annexed marked A.

The "double-link motion" has been manufactured by the defendant since the service of said injunction.

The plaintiffs claimed that this was substantially the same as the "bridle motion," and, equally with that, an infringement of their patent.

43 This the defendant denied. Upon the issue thus raised the parties prefferred models of the mechanism, and expert testimony; but the master does not find that he is by said decretal order directed to hear and determine questions of infringement arising upon inspection of mechanism having apparent differences. The master therefore refers to the court the whole question touching the defendant's infringement in the manufacture of the said "double-link motion." At the request of the parties the master reports to the court the profits made by the defendant in the manufacture of the said "double-link motions." The same will be found in the schedule annexed hereto and marked B. The parties introduced the evidence upon this subject and agreed that the same might be used on the trial, a list of which is hereto annexed and marked C.

The master further reports that the defendant made and sold said "bridle motions after said re-issue with and as a part of looms

44 manufactured in his establishment; that the profits resulting from the manufacture of said "motions," so sold, have mingled with the profits resulting from the manufacture of said looms.

That the cost of making said looms during the time under inquiry was $59.63, including said "bridle-motion." The cost of making said motion was 45½ cents each, or ninety-one cents for each loom. The profit resulting from the manufacture of said looms complete, with said "bridle motion," was $5.64 for each loom.

The defendant insisted that the plaintiffs were entitled to claim, as profit resulting from the manufacture of said "bridle motions," when sold with the looms, and as a part thereof, only a sum that would bear the same proportion to said sum of $5.64, the whole profit, that 91 cents, the cost of the pair of "bridle motions," would bear to $59.63, the cost of the whole loom, which would be $8\frac{6}{10}$ cents. The master declined to adopt that rule of ascertaining the profits.

The master further reports, that the defendant made "bridle-
45 motions" after a pattern of his own devising; that they cost per pair fifty cents less than the picker-staff mechanism which he had immediately previous put upon his looms; and that twenty-five cents each, or fifty cents per pair, is the sum properly chargeable as the profit derived by the defendant for each pair of "bridle motions" made and sold upon looms and as a part thereof. The "bridle motions" made by the defendant were made under a patent granted to him, and they cost about fifty cents less than the picker-staff motions made by the plaintiffs; the difference in the cost of manufacture being due to the defendant's invention.

The master further reports, that the "bridle motions," and the several parts thereof, made by the defendant during the time inquired of, and sold apart from looms, produced to him a profit which is readily ascertained, by deducting from the price actually received by the defendant, as appears in his books, the cost as ascertained. The profits resulting from this manufacture, and from the manufacture of said mo-
46 tions which were sold with looms, are stated in the account set forth in said Schedule A.

The master finds and reports, that the defendant has derived a profit from the manufacture of said "bridle motions," made in infringement of the plaintiffs' patent, the sum of $3329.40 (thirty-three hundred twenty-nine & $\frac{40}{100}$ dollars.)

The master further reports, that the profits derived from the manufacture of the "double-link motions" by the defendant amount to $281, (two hundred & eighty-one dollars.) These, like the "bridle motions," were sold by the defendant both upon and apart from looms. The cost was forty-five and one-half cents each. When sold upon looms the profit was fifty cents per pair. The profit on those sold separately from looms was found by deducting the cost from the amount received by the defendant, as appears by his books. The profits thus ascertained is specifically entered in Schedule B, hereto annexed.

The master further reports, the defendant presented a paper, a
47 copy of which is hereto annexed, marked D. The paper was admitted to be authentic, and that the defendant paid the money named in this paper to protect the purchasers of said motions from suit, and that he agreed to protect them from all claims of patentees when they purchased from him.

The defendant claimed that the said money should be added to the cost of the "bridle motions," or in some way applied to reduce the amount of profits which should be found resulting from the manufacture.

The master finds that the money named was paid by the defendant to the plaintiffs' attorney as and for the purpose set forth in paper D, and admitted as above, after the decree was passed in this case; that it forms no part of the cost of manufacturing said "bridle motions," and cannot be here considered in reduction of the amount found as profits of manufacture. If this is a payment on account of the sum ultimately adjudged against the defendant in this case, it is not within the matter submitted to the master by the decretal order.

48 The master further reports, that the different parts of said "bridle motion" cost as follows, viz: each rocker $12\frac{4}{10}$ cents; each bed, including set-screw, $27\frac{2}{10}$ cents; and each link, 6 cents; that these parts were from time to time sold by the defendant for prices that appear in his books, and for the purpose of supplying corresponding pieces that had been broken in motions previously furnished by him. The defendant claimed that no account should be taken of the profits resulting from the sales of these parts, as they were employed simply to supply broken portions of "motions," which were to be entered in this account, and the profits of which the master was to charge against the defendant. But the master finds that the profits derived from the sales of these parts of motions are properly chargeable to the defendant, and the same are specifically entered in said Schedule A.

The pl'ffs claimed that they were entitled to recover, for the motions sold upon looms, one $\frac{9}{100}$ dollars per pair, being the difference be-
49 tween the cost, 91 cents per pair, & the general selling price, 2 dollars per pair; but this the master refused.

All of which is respectfully submitted.

E. F. HODGES,
Master in Chancery.

Master's fees for ten days in hearings & upon the proofs, 3/c, & report, $250.

50 GRAHAM & AL. } Master's report.
vs.
MASON. }

SCHEDULE A.

Profits on bridle motions for looms made & sold by W'm Mason.

3,639 pairs bridle motions sold on looms to sundry parties at a profit of fifty cents p'r pair		1,819 50
414 pairs sold separately from looms, at ten dollars per pair, 828	828 00	
Deduct cost, at 91 c'ts p'r pair	366 74	
Leaves a profit of 451.26		451 26
$297\frac{1}{2}$ pairs sold separately from looms, at different prices, amounting in all to 534.75	534 75	
Deduct cost, 91 cents p'r pair	271 75	
And the profit is		263 00
346 beds, (parts of bridle motions,) sold at various prices, amounting in all to 313	313 00	
Deduct cost, at $27\frac{2}{10}$ cents each	94 11	
And the profit is 218.89		218 89
1,548 rockers, (parts of bridle motions,) sold at various prices, amounting in all to 768.70	768 70	
Deduct cost, $12\frac{4}{10}$ cents each	191 75	
And the profitis		576 75
		3,329 40

51 SCHEDULE B.

GRAHAM & AL. vs. MASON. } Master's report.

Profits on double-link motions for looms made & sold by W'm Mason.

Profits on 492 pairs sold to sundry persons, 50 cents each		246 00
Profits on 111 pairs sold separately from looms for	121 00	
Deduct cost, at 91 c'ts each	101 00	
And the profit remaining is		20 00
192 links sold sundry persons, for 26.52	26 52	
Deduct cost, at 6 cents each	11 52	
Leaves as profit		15 00
		281 00

52 SCHEDULE C.

GRAHAM & AL. vs. MASON. }

PATENTS.

Patentee.	Date.	No.
Benj. Lapham	Jan'y 25, 1838	575
W'm Stearns	July 5, 1859	24,668
John L. Cheney	March 17, 1857	16,824
Daniel Barnum	March 26, 1845	3,969
Warren W. Dutcher	June 27, 1846	454
Re-issued	April 21, 1857	454
Levi Ferguson	May 19, "	17,323
Samuel Edes	Nov. 23, 1858	22,114
Elisha Robbins	March 11, 1862	34,647
" "	May 27, "	25,395
Albert S. Lyons	January 27, 1863	37,513
Amoskeag Man'f'g, ass'ee of N. J. Bean	" 22, 1861	31,205
Re-issued	May 28, 1867	2,627
"	Aug't 24, "	2,749
W'm Mason	June 2, 1868	78,463
Rensselaer Reynolds		

53 AFFIDAVITS.

Warren W. Dutcher	Nov. 11, 1869
Isaac R. Scott	" " "
George Draper	" " "
Henry B	Oct. 7, "
George Draper	" 13, "
W'm C. Lovering	" 14, "
Charles M. Keller	Sept. 3, 1870
Warren W. Dutcher	" 5, "

Also the printed record in this case.

54 SCHEDULE D.

GRAHAM & AL.
vs.
MASON.

BOSTON, *Oct.* 25, 1869.

Received of W'm Mason, of Taunton, one thousand dollars, (1,000,) in full satisfaction for our right to collect back damages for the past infringement of re-issue letters-patent of May 28th, 1867, for picker-staff motion, by the individuals and corporations who have used bridle motions of Mr. Mason's make, & as tariff for the future use of such motions. It is understood and agreed that the number of these motions does not exceed 5,451, and that Mr. Mason is to furnish us with a list of the names of the users and the number sold by him to each, and that the bridle motions enumerated in that list are all hereby licensed. This bridle motion is the motion that has been patented by Mr. Mason. It is also understood and agreed that this settlement does not affect
55 in any manner our right to recover profits or damages from Mr. Mason for his infringement of said patent, and that the suit of Graham & al. vs. Mason shall proceed precisely as if this settlement never had been made. It is also understood that this agreement relates simply and solely to the bridle motion and no other, and licenses simply those bridle motions of Mr. Mason' make not already licensed, and no others.

(Signed) WANTON ROUSE,
E. H. GRAHAM,
By J. E. MAYNADIER,
Their Att'y.

" W'M MASON.

On the thirteenth day of April, A. D. 1871, the defendant filed the following exceptions to master's report, namely:

The defendant excepts to the master's report, for that the master declined to adopt the rule prayed for by the defendant for ascertaining the profits resulting from the sale of bridle motions sold with the looms and as a part thereof, said profits being mingled with the profits result-
56 ing from the manufacture of the looms, and amounting to $8\frac{6}{10}$ cents for each pair of bridle motions; but adopted another rule, and reported as profits fifty cents per pair, because the defendant made said motions for fifty cents less per pair than the picker-staff motions he had before that made, although he made the bridle motions after a pattern of his own devising, and the profit was due to the defendant's own ingenuity; and the defendant says said rule adopted by the master was erroneous, and that he ought to have adopted the rule asked for by the defendant.

Also, for that the master found the profits on picker-staffs sold with and as a part of looms to be fifty cents on each pair of bridle motions; whereas he ought to have reported the profits on such motions to be eight and six-tenths cents for each loom, and this upon the facts reported by him.

Also, for that the master reported $451.26 as the profit on 414 bridle motions sold separately from looms; whereas it appears from the
57 report that the profits on each of said motions was only fifty cents more than the profits on motions before that made by him, and

that said increase of profits was due to the defendant's use of a pattern of his own devising.

Also, for that the master found and reported the profits on parts of bridle motion, to wit, the sums of $218.89 and $576.75; whereas, as appears, said profits were not so much in excess of motions before that time made, and were not due to the use of the plaintiffs' pattern, and also because said parts were sold for the purpose of repairing or restoring motions already once charged with a profit by the master.

Also, for that the master erred in finding and reporting that the plaintiff' is entitled to any profits whatever, it appearing that the motions made by the defendant were fifty cents less than the motions before made by the defendant; that they were made under a patent granted to him, and that they cost about fifty cents less than the picker-staff motions made by the plaintiffs, the difference in the cost of manufacture being
58 due to the defendant's invention.

Also, for that the master refused to allow, in reduction of the defendant's profits, the $1,000 paid as appears by paper D; whereas he should have allowed the said amount by adding the same to the cost of bridle motions, or in some other way applying the same to reduce the profits which should be found resulting from the manufacture.

By BENJ. DEAN,
His Att'y.

On the twenty-first day of April, A. D. 1871, the complainants filed the following exceptions to master's report, namely:

The complainants except to the master's report—

First. For that the master declined to adopt the rule prayed for by the complainants for ascertaining the profits resulting from the manufacture and sale of picker-staff motions sold with looms, and as a part thereof, namely, the difference between the cost per pair (91
59 cents) and the general selling-price (two dollars) per pair.

By J. E. MAYNADIER,
Their Solicitor.

This cause was thence continued to the May term of this court, A. D. 1871, when, the honorable George F. Shepley, circuit judge, holding said court, this cause came on to be further heard upon the said exceptions to master's report. This cause was thence continued to this present term, when the following decree is entered, namely:

Circuit court of the United States, district of Massachusetts, Oct. T., 1871, to wit, Jan. 15th, 1872.

EDMUND H. GRAHAM ET AL.
v.
WILLIAM MASON. } In equity.

Decree.

This cause came on to be heard at the last term of this court
60 upon exceptions to the master's report and for a final decree, and was argued by counsel for the respective parties. This cause was thence continued under advisement to this present term; and now, to wit, Jan. 15, 1872, after due deliberation thereon had, it is ordered, adjudged, and decreed that the exceptions of the complainants and of the defendant to the master's report are overruled, and that the said mas-

ter's report be, and the same is hereby, approved and confirmed. It is further ordered, adjudged, and decreed that the said Edmund H. Graham and Wanton Rouse, complainants, recover of the said William Mason, defendant, the sum of three thousand three hundred and twenty-nine dollars and forty cents as and for the profits which the said defendant has made or received from his infringement of the re-issued patent of the complainants, dated May 28th, 1867, upon which this suit is founded, as reported by the master in Schedule A annexed to his report.

It is further ordered, adjudged, and decreed that the said com-
61 plainants recover of the said defendant their costs of suit, taxed at six hundred and five dollars and eighty-eight cents.

Whereupon the said defendant in open court claims an appeal to the Supreme Court of the United States, which appeal is allowed by the court, and said defendant gives good and sufficient security to prosecute the said appeal with effect, and to pay all damages and costs in case he shall fail to make good his said appeal; which security is approved by the court.

A true record.
Attest: JOHN G. STETSON, *Clerk.*

62 At the hearing of said cause the following evidence was used:

Evidence for complainants.

Edmund H. Graham, of Manchester, N. H., and Wanton Rouse, of Taunton, Mass., assignees of Edmund H. Graham. Letters-patent No. 30441, dated October 16, 1860; Re-issue, No. 2367, dated October 2, 1866; re-issue, No. 2626, dated May 28, 1867. Improvement in picker-staff motion for looms.

The schedule referred to in these letters-patent and making part of the same.

To all whom it may concern:

Be it known that Edmund H. Graham, of Manchester, County of Hillsborough, and State of New Hampshire, did invent certain new and useful improvements in picker-staff motions for looms. And I, the said Graham, and I, Wanton Rouse, of Taunton, county of Bristol, and State of Massachusetts, (assignee of an undivided half part thereof, by assignment duly recorded in the United States Patent-Office,) do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 represents a vertical central longitudinal section through so much of a picker-staff and its appurtenances, embracing said improvements, as is necessary to illustrate the invention.

63 Figure 2 represents a central longitudinal horizontal section through the retracting spring of the picker-staff and its cylinder.

Figure 3 is a plan or top view of Fig. 1.

In the devices commonly employed, previous to the invention herein claimed, for vibrating the picker-staffs of looms, the rapid motion necessarily communicated to the picker-staffs, in order to drive the shuttles with the requisite rapidity, soon causes a derangement and consequent "wabbling" of the parts, and necessitates frequent repairs, as it is essential that the motions of the picker-staff should be accurate.

The object of the improvement herein claimed is to produce an accurate and sure motion for picker-staffs, by a combination of devices, which, while giving great accuracy of motion, so guides and holds the picker-staff as to cause it to operate with the least possible friction and lateral disarrangement or wabbling.

In the accompanying drawings *a a* represents a curved rocker, in the socket, *b b*, of which the picker-staff is to be fastened. The rocker, *a a*, plays upon a horizontal bed, *c c*, having a socket, *d*, through which the shaft of the loom passes in the usual way. The shank, *e e*, of the rocker, *a a*, is made hollow, or with a suitable box or bearing, *f f*, into which a shaft-arm or bar, *g g*, is inserted, which arm, by means of journals projecting each side thereof, has a bearing in the eyes, *i i*, formed in the bed-piece, *c c*. By this arrangement the rocker (in its reciprocating movement) is kept perfectly true in its bearings by the arm or bar, *g g*, which holds the rocker, *a a*, truly in position, in consequence of its long bearing therein; and as the arm or bar, *g g*, also oscillates freely upon its journals, *h h*, which further serve to steady the rocker laterally, the rocker moves with the least possible friction, and with the greatest accuracy, so that the wear and tear is necessarily but very slight. The eyes or bearings, *i*, have inclined slots (shown in dotted lines in fig. 1,) cut in them so as to form ears or open boxes, in which the journals, *h h*, are inserted when the parts of the picker motion are put together. By this means the shaft or arm, *g*, and its journals, *h*, can readily be removed and replaced, and are free to play without liability to work out of their bearings. The rocker, *a a*, is retracted by means of a
64 spiral spring, *k k*, wound loosely around a short shaft, *l*, and attached at one end to a plate, *m*, which turns freely on the shaft *l*. A strap, *n*, attached to the plate *m*, fits over a hook, *o*, on the under side of the rocker, *a a*. As the spring, *k k*, is liable to partially lose its force by the motions of the rocker *a a*, I have provided for this contingency by forming, in the plate *m*, a series of holes, *p p*, into which successively one end of the spring, *k k*, is set, as fast as it loses its elastic force, whereby the spring can be set up at pleasure, and its force graduated, without the necessity of frequent repairing or renewals.

The first part of this invention relates to the position of the journals. This position is determined by the position of the socket for the picker-staff, which socket is so placed that the point of the picker-staff which strikes the shuttle must move in the required line; and this part of the invention consists in placing the journal at or near this socket, and as near the level of the bed as practicable. In this position there is the least possible wear, and the journals perform all their functions to the best possible advantage. It is obvious that as every point upon the rocker varies its position in the action of the motion, with reference to the bed, it is impossible to connect the journal directly with the rocker and its box directly with the bed, or vice versa. One or the other must be indirectly connected, and it is for this reason that in the motion described the journals are placed upon the arm *g*, upon which the rocker can play up and down. So far as we know, no rocker has ever been combined with its bed by means of journals before this invention.

The second part of this invention consists in forming the boxes or bearings for the journals with such an opening that the journals may be laid in them in putting the motion together, without liability to work out in the operation of the rocker, as plainly shown in the drawings. This method of construction is much cheaper than making the boxes cylindrical, and is quite as efficient in every respect.

What is claimed as the invention of the said Graham is—

1. The combination of a rocker of a picker-staff with its bed by loose journals projecting each side of the picker-staff, and arranged beneath the picker-staff, substantially as described.

65 2. In combination with the rocker, the bed and the journals, the open boxes, substantially as and for the purpose described.

3. In combination with the rocker and its bed, the journal-bearing arm, operating substantially as and for the purpose specified.

EDMUND H. GRAHAM.
WANTON ROUSE.

Witnesses:
A. F. JEWETT.
J. E. MAYNADIER.

Edmund H. Graham, of Manchester, N. H. Letters-patent No. 30441, dated October 16, 1860.

To all to whom these presents shall come:

Be it known that I, Edmund H. Graham, of Manchester, in the county of Hillsborough and State of New Hampshire, have invented certain new and useful improvements in the parallel or rocker motion for picker-staves in looms, and that the following description, taken in connection with the accompanying drawings hereinafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvements, whereby my invention may be distinguished from all others of a similar class, together with such parts as I claim and desire to have secured to me by letters-patent. The figures of the accompanying plate of drawings represent my improvements. Figure 1 is a central vertical section. Figure 2 is a detail view. Figure 3 is a plan or top view of my improvements. In the devices heretofore commonly employed for producing the parallel or rocker motion for picker-staves in looms, the rapid motion to which they are necessarily subjected, in giving the blow to the shuttle, soon causes a disarrangement and "wabbling" of the parts, and, as it is essential that the motions should be accurate, repairs and renewals of the machinery are almost constantly required. The present improvement has for its object the producing of an accurate and sure motion for picker-staves, by an arrangement of devices which, while giving great accuracy of motion, so guides and holds

66 the rocker-shaft in its play back and forth, as to cause it to operate with the least possible friction and lateral disarrangement or "wabbling." *a a*, in the drawings, represents a curved rocker, in the socket, *b b*, of which the picker-staff is to be fastened. The rocker, *a a*, plays upon a horizontal bed-piece, *c c*, through a socket, *d*, of which the shaft of the loom passes. The shank, *e e*, of the rocker, *a a*, is made hollow, or with a suitable box or bearing, *f f*, into which extends vertically a shaft or bar, *g g*, which shaft or bar, *g g*, by means of short journals, *h h*, has a bearing in the eyes, *i i*, formed in the bed-piece, *c c*. By this arrangement, the rocker, in its reciprocating movements, is kept perfectly true in its bearings, and cannot "wabble" by the shaft or bar, *g g*, which holds the rocker, *a a*, always in position, in consequence of its long bearing therein; and as the shaft or bar, *g g*, also turns freely upon its journals, *h h*, which further serve to steady the rocker laterally, it (the rocker) moves with the least possible friction, and with the greatest accuracy, so that the wear and tear is necessarily but very slight. The rocker, *a a*,

is retracted by means of a spiral spring, *k k*, wound loosely around a short shaft, *l*, and attached at one end to a plate, *m*, which turns freely on the shaft, *l*.

A strap, *n*, attached to the plate *m*, fits over a hook, *o*, on the under side of the rocker, *a a*. As the spring, *k k*, is liable to partially lose its force by the motions of the rocker, *a a*, I have provided for this contingency by forming in the plate, *m*, a series of holes, *p p*, &c., into which, successively, one end of the spring, *k k*, is set, as fast as it loses its elastic force, whereby the spring can be set up at pleasure, and its force graduated without the necessity of frequent repairing or renewals. Having thus described my improvements, I shall state my claim as follows: What I claim as my invention, and desire to have secured to me by letters-patent, is the arrangement of the rocker, *a a*, and guiding shaft or bar, *g g*, travelling in suitable journals or bearings, *h h*, and operating together substantially as described.

EDMUND H. GRAHAM.

Witnesses:
JOSEPH GAVETT.
ALBERT W. BROWN.

67 Edmund H. Graham, of Manchester, N. H. Letters-patent 30441, dated October 16, 1860. Re-issue No. 2367, dated October 2, 1866. Improvement in picker-staff motion for looms.

To all whom it may concern:

Be it known that I, Edmund H. Graham, of Manchester, county Hillsborough, State of New Hampshire, have invented certain new and useful improvements in picker-staff motions for looms; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art to which it most nearly appertains, to make and use my said invention and improvements without further invention or experiment.

The nature of my invention and improvements consists in steadying and holding the rocker of the picker-staff on its bed by a journal or journals at a right angle to the picker-staff, substantially as described in the following specification, and in making the boxes of the aforesaid journals with open ears.

In the above-mentioned drawings, figure 1 is a sectional elevation, representing my invention cut vertically and centrally lengthwise through Figure 3. Figure 2 is a section of the spring and its cylinder. Figure 3 is a plan or top view of the whole.

In the drawings, *c c* is the rocker-bed, made of cast iron, in the form shown, or in such other form as will answer the purpose, with an end, *d*, having a hole through it, as shown in Figure 1, for the end of the rock-shaft of the lay of the loom, to which shaft it may be fastened by a set-screw or otherwise.

The top of the bed, *c*, is horizontal, to receive the rocker, *a a*, which is arranged to rock on it. This rocker is also made of cast iron,
68 in the form shown, or in such other form as will answer the purpose, and provided with a standard, *e e*, in the upper end of which there is a socket, *b b*, to receive the lower end of the picker-staff. Below the socket, *b*, there is a hole, *f f*, entirely through the rocker, for the arm, *g g*, of the rock-shaft, which has journals, *h h*, working in boxes, *i i*, which project up from the sides of the bed on each side of the rocker, as shown by dotted lines in Figure 1. There is an inclined score cut across the boxes, *i i*, into which scores, which form boxes with open ears, the

journals, *h h*, of the rock-shaft are laid, and in which they work as the rocker is rolled in vibrating the picker-staff.

There is an arm extending down from the bed, *c*, which arm has a hollow horizontal hub, *l l*, projecting from it, shown in section, Figure 2.

Upon the hub, *l*, there is a coiled spring, *k k;* one end of this spring is stopped by a pin put through the end of the hub, and the other end enters one of the holes in the loose collar, *m m*, which has a hook on its periphery for the strap, *n*, which connects the collar and spring to the hook, *o*, on the under side of the rocker, *a;* so that the spring, *k*, may roll the rocker back, and also the picker-staff, after it has thrown the shuttle. The force of the spring, *k*, may be adjusted by changing the end of the spring to different holes, *p p*, in the collar, *m*. The hook, *o*, on the under side of the rocker, *a*, works through a slot in the bed, *c*.

Having described my improvements, I claim steadying the rocker of the picker-staff on its bed by journals, at a right angle to the picker-staff; which journals form its centre of motion substantially as described.

I also claim the journal-boxes with open ears, in combination with the journals that steady the rocker on the bed.

EDMUND H. GRAHAM.

Witnesses:
J. DENNIS, J'R,
EDM. F. BROWN.

69 *Deposition of Cha's F. Sleeper.*

NOVEMBER 13, 1867.

Int. 1. State your name, age, residence, and occupation.

Ans. Charles F. Sleeper; age 40 years; residence, Roxbury, Mass.; occupation, architect and solicitor of patents.

Int. 2. Please state, generally, what experience you have had as a mechanician, and in comparing different mechanisms for the same purpose in order to ascertain their similarity or dissimilarity.

Ans. For the last seventeen years I have been in the habit of making mechanical drawings. I have had to make such comparisons as are inquired of for the last year and a half in the course of my profession as solicitor of patents.

Int. 3. Have you examined the re-issue letters-patent, dated May 28th, 1867, of the complainants in this case, and do you understand the construction of the instrument there shown, and its purposes and intended operation?

Ans. I have examined it, and believe that I understand its construction, purposes, and intended operation.

Int. 4. Please describe the purpose, construction, and intended operation of the mechanism described in that patent so far as relates to the subject-matter of the first claim.

Ans. Its purpose is to compel that part of the picker-staff which strikes the shuttle to move in the required line. It is constructed with a rocker and its bed, with journals and boxes, and with an arm to which the journals are made fast. These are the essential parts relative to the first claim, though there are many other parts going to make up the entire mechanism.

The rocker prevents deviation from the required line above and
70 below. The journals and their boxes prevent deviation from that line sidewise or in a backward or forward direction. The jour-

nal-bearing arm operates to allow a rocking motion. In a loom the picker-staff, made fast to the socket *b b*, is held in a position to throw the shuttle by means of a spring attached to the rocker. An instantaneous forward motion of the picker-staff throws the shuttle, and the spring as instantaneously returns the picker-staff to its original position.

Int. 5. Please state how the mechanism is attached to the loom, and in what way the staff is commonly operated.

Ans. The mechanism is attached to the loom by means of a sleeve, (called in the patent, socket D,) which fits upon the rock-shaft and is fastened to it by means of a set screw. The end of the picker-staff passes through a slot in the shuttle-box. The spring attached to the rocker is fastened to some proper part of the loom, commonly the rail at the bottom of the loom. A rod is commonly connected to the picker-staff a short distance above the top of the socket; the other end of the rod being connected with the mechanism which throws the staff, commonly what is called a bat-wing shaft.

Int. 6. What do you understand by the term "wabbling," used in the patent?

Ans. Wabbling is a sidewise deviation of the rocker and shaft from the required line of their motion.

Int. 7. What produces this wabbling in the practical operation of the mechanism?

Ans. The rapid jerking motion of the mechanism; the power not being always employed in the direct line of the play of the rocker—the picker-staff striking the shuttle one side of the central line of the picker-staff. There are several other causes. The inequality of weight of the sides of the mechanism; irregularities of the surface of the rocker in its bed, and the motion of the rock-shaft. The most important causes are the first three mentioned.

Int. 8. What effect is produced by this wabbling? and state how that effect is produced.

Ans. Wabbling frequently causes the shuttle to be thrown from the race, that is, thrown out of the loom, and causes increased wear of
71 the various parts of the rocker mechanism. It is necessary that a certain point of the picker-staff shall strike the shuttle in the same place at each throw, in order to drive the shuttle in a straight line, and that the blow shall be given in the same direction each time. When a staff wabbles, it varies the stroke from the direct line, and thereby drives the shuttle in the wrong direction; and when the staff has worn for some time, a cavity is made by the point of the shuttle in the picker-leather, and wabbling causes the side of the cavity to strike on one side of the point of the shuttle, thus driving the shuttle in the wrong direction,

Int. 9. What is the importance, in the practical operation of these motions, of preventing wabbling?

Ans. It is of absolute importance, as is obvious from what I have said of its effects.

Int. 10. Please point out, in the mechanism now shown to you, marked Exhibit No. 1., N. A. P., ex'r, the parts whose function it is to prevent this wabbling?

Ans. The journals and their boxes and the journal-bearing arm.

Int. 11. Compare "Exhibit No. 1" with the mechanism described in the patent, and state how they differ, if at all.

Ans. The principal difference is that the journal-bearing arm is square in the exhibit, and round in the patent; but there is no practical difference in the construction of the two. The slot is open in the exhibit,

and closed in the patent, above the journals. An aperture is shown in the bed above the opening for the rock-shaft in the patent, which is not in the exhibit. These differences are unimportant, and the exhibit practically embodies the mechanism shown in the patent.

Int. 12. What do you understand by the term "loose journals," used in the first claim of the patent?

Ans. Journals not fast to the rocker or bed, but upon a separate piece.

Int. 13. Is that term known in mechanics, or do you derive the meaning you have given from the description in the patent?

Ans. It is not, to my knowledge, used in mechanics. I derive my definition from the description in the patent which says, "It is
72 obvious that as every point upon the rocker varies its position in the action of the motion with reference to the bed, it is impossible to connect the journals directly with the rocker, and its box directly with the bed, or vice versa; one or the other must be indirectly connected, and it is for this reason that, in the motion described, the journals are placed upon the arm *g*, upon which the rocker can play up and down."

Int. 14. Have you examined the rocker motion now shown you, represented in Exhibit No. 2, N. A. P., ex'r, and do you understand its construction and operation? If so, state whether, in your judgment, that mechanism is substantially similar to, or substantially different from, the mechanism described in said re-issue patent, and state your reasons for your opinion.

Ans. I have examined the exhibit, and have seen it in practical operation on a loom, and understand its construction and mode of operation. It is substantially similar to the mechanism described in the re-issue patent. I find in the exhibit a rocker combined with its bed by loose journals and their boxes, operating in substantially the same manner as in the mechanism described in the patent. The journals extend, in Exhibit No. 2, each side of the picker-staff, and also in the mechanism described in the patent, and are arranged beneath the picker-staff substantially as shown in the patent.

Int. 15. Please state what is the peculiarity of construction of the mechanism shown in the patent in reference to the second claim, and state the purpose of that peculiarity of construction.

Ans. This peculiarity consists in forming the journal-boxes with such an opening that the journals may be laid in them, in putting the motion together, without liability to work out in the operation of the rocker. The purpose of this construction is to lessen the cost.

Int. 16. State whether, in this respect, the construction and operation of Exhibit No. 2 is substantially similar to, or substantially different from, the construction of the mechanism shown in the patent.

Ans. It is substantially the same. They both effect the same purpose in the same way.

Int. 17. What parts, in Exhibit No. 2, perform the function
73 of preventing wabbling, disregarding the V-shaped rocker-bed; and how do they perform that function?

Ans. The journal-bearing arms, the journals and their boxes, by the holding the rocker in its proper position on the bed.

Int. 18. In the mechanism described in the patent, and in Exhibit No. 2, what parts prevent the deviation of the rocker from its proper position in a forward and backward direction?

Ans. The journals and their boxes, and the journal-bearing arms.

Int. 19. Have you examined the mechanism now shown you, marked

Exhibit No. 3, N. A. P., ex'r, and do you understand its construction and mode of operation? If so, please state whether, in your judgment, it is substantially similar to, or substantially different from, the mechanism shown in the re-issue patent, giving your reasons for your opinion.

Ans. I have examined the same, and understand its construction and operation. It is substantially the same as the mechanism shown in the re-issue patent. I find, in the exhibit, journals and boxes to prevent wabbling and forward and backward deviation of the rocker from its position, the journals extending each side of the picker-staff, and being arranged beneath the picker-staff, all as in the mechanism described in the patent, and operating in substantially the same way to produce the same result. I do not find in the exhibit "loose journals," but I find loose boxes, that is, boxes not fast to the rocker in its bed, but upon a separate piece. This I consider a merely formal variation of construction, as it is evident that the operation of the mechanism will be the same, whether the journals or the journal-boxes were loose. I find no open boxes upon the exhibit, nor anything to perform their purpose, and, therefore, in this respect, I regard the two as substantially different.

Int. 20. Please state what functions are performed by the arm *g*, in the re-issue letters-patent.

Ans. It bears the journals; it connects the rocker with the bed, by means of the journals and their boxes, and allows the rocking motion of the rocker.

Int. 21. What are the functions of the arms in Exhibit No. 2, each side of the rocker?

74 Ans. To bear the journals, to connect the rocker with its bed by means of journals and their boxes; to allow the rocking motion of the rocker, and to prevent wabbling, in substantially the same manner as the inside of the journal-boxes in the patent mechanism prevent wabbling.

Int. 22. In each case are these functions performed by the arms in substantially the same, or in substantially a different way? And state whether, in your judgment, the arms are substantially the same, or substantially different.

Ans. The functions are performed in substantially the same way, but the arm in the Mason performs one function not performed by the arm in the patent. In my judgment, inasmuch as they both perform the same functions in substantially the same way, they are substantially the same.

Int. 23. Please state generally how the curve of the rocker is determined.

Ans. To compel the point of the picker-staff which strikes the shuttle to move in a line parallel to the rocker-bed, the curve of the rocker should be an arc of a circle made from that point as a centre; for example, the centre of a wheel always travels parallel to the surface over which the wheel rolls. In operation, the point of the picker-staff commonly rises slightly before completing its throw of the shuttle, and the curve of the rocker is therefore not the arc of a circle, but the curve of a constantly increasing radius towards the inner end of the rocker.

Counsel for defendant declines to cross-examine.

CHA'S F. SLEEPER.

(Counsel for complainant here puts in evidence certified copy of letters-patent granted E. H. Graham, dated October 16, 1860, No. 30441;

also certified copy of specification and drawing of re-issue letters-patent granted same, dated October 2, 1866, No. 2367.)

N. A. P., *Ex'r.*

75 *Second deposition of C. F. Sleeper.*

APRIL 17TH, 1868.

Int. 1. Have you been previously examined as a witness in this case?

Ans. I have.

Int. 2. Have you examined, and do you understand the several exhibits marked Ex. D, Ex. E, and Ex. C, (being certified copies of letters-patent issued to Lapham, Barnum and Stearns?)

Ans. I have seen certified copies of the letters-patent of Lapham & Barnum, and I have seen a description and drawing of the mechanism of Stearns, as given in the Patent-Office reports. I have also seen a rocker mechanism, which I understand to be of the kind now manufactured by Draper, under the Stearns patent. I understand the construction and operation of all the three mechanisms referred to.

Int. 3. Compare the rocker motion shown in the Lapham patent with that shown in the re-issue patent sued on, and state their substantial identity or difference, giving your reasons fully, and bearing in mind the several combinations as described in the re-issue patent and specified in the claims.

Ans. I find in the Lapham patent the rocker and bed substantially like Graham's. They are also combined by means of a journal substantially like Graham's in every respect except one, namely, it projects from one side only of the picker-staff. There is another difference, namely, that Lapham's journal is fast and his box loose; but the difference between the loose journal in the combination specified in the re-
76 issue, and the loose box in Lapham's is, in my opinion, merely formal in this combination, as the journals operate precisely the same after the motion is put together, whether they or their boxes are loose; and as this is distinctly pointed out in the latter part of the last paragraph in the description beginning, "It is obvious," and ending, "Upon which the rocker can play up and down," it would, in my opinion, be a mere evasion to make the boxes loose instead of the journals, if this claim of the re-issue patent be broad enough to cover this part of the real invention, which I consider to be the combination of a rocker, a bed, and journals, projecting each side of the picker-staff when either the journals or their boxes are indirectly connected with either the rocker or the bed. The difference in the projection of the journals I regard as the only substantial differences between Lapham's and the combination specified in the re-issue first claim. Lapham's, I have no doubt, is utterly inoperative as a rocker motion, for the slip of the rocker upon the bed would be so very great as in itself to be an extremely serious objection; but even if it did not slip, the fact that the whole strain was on one side of the rocker would be a vital objection to the motion shown in the Lapham patent, and make it practically worthless. And the means shown for holding the other side of the rocker, namely, the vertical friction surface, would be worthless, because inoperative, unless the rocker were held in some way to that surface, and I see no indication of any means to this end except the box-bearing arm and the journal, which I do not believe would last a single day.

For these reasons I regard Lapham's as containing a combination of rocker, bed, and loose journals substantially; but I have no doubt that the third element of this combination, namely, the loose journals, is

the roller is greater than the friction of the roller upon the pin, and, in my opinion, the latter will be in every case the greater, after a short use of the mechanism;) nor loose boxes or boxes of any kind, (for the same reasons which show that the pin is not a journal show also that the roller is not a box;) and therefore I am clearly of opinion that Stearns' mechanism lacks one essential feature of the combination specified in the first claim of the re-issue.

It also lacks one essential feature, at least, of the combination specified in the second claim; for, even if it can be made to appear that the pin and its roller are a journal and its box, it is obvious that the roller is not an open box, and performs none of the functions characteristic of an open box.

It also obviously lacks an essential element of the combination specified in the third claim, namely, the journal-bearing arm, and has no part similar to it.

If an arm was attached to the friction-roller, and connected with the rocker or the bed (the pin in the latter case being connected to the rocker) in such a way as to compel the roller to turn when the rocker moves, the mechanism will then contain Graham's combination substantially as specified in the first claim, but not that specified in the third claim; because the arm will be a box-bearing arm, and not a journal-bearing arm.

Or, if the journal-bearing arm be taken away from Graham's mechanism, and the journals be connected by a shaft, so as to make a cylindrical pin extending through the slot in the rocker, but leaving the journals free to move, the mechanism would be substantially like Stearns', although an improvement upon Stearns'; because the ends of the pin would be less likely to stick in the boxes than Stearns' roller to stick on his pin, and the pin also could be much more easily removed, when worn, and a new one put in.

Adjourned to 18th inst., at 10 a. m.

81 APRIL 18TH.—Resumed.

Int. 7. Compare Exhibits No. 1 and No. 2, in view of the state of the art as shown in Lapham, Barnum, and Stearns, but without regard to the description and specifications of claims in the re-issue patent, and state fully their substantial identity.

Ans. In both I find a rocker and a bed, and a third piece whose office is the same in both. The entire functions performed by this third piece in Exhibit No. 1 are as follows: First, it is a positive connection between the rocker and the journals. Second, it compels the journals to turn in the boxes; that is, compels a journal operation of the journal; and, third, it receives all the wear except that borne by the bed and the rocker. It consists of two parts, namely, journals and journal-bearing arm.

The same piece in Exhibit No. 2 is also a positive connection between the bed and the journals. It compels the journal operation of the journal, and it receives all the wear except that borne by the rocker and the bed. It consists, also, of two parts, namely, journals and journal-bearing arm or arms, (if we regard the three sides as separate arms.)

In view of the mechanism of Lapham, I have no doubt that both Exhibits No. 1 and No. 2 embody substantially the same improvements upon Lapham, namely: First, extending Lapham's journal through the rocker so as to make it project from each side of the picker-staff; second, in putting the journals upon an arm instead of the boxes; and third, in making the boxes open.

In view of Barnum and Stearns, I have no doubt that both exhibits embody substantially the same improvements upon those mechanisms, namely, in Barnum the substitution of journals on a journal-bearing arm for the pin, so that the journal shall be compelled to turn when the rocker moves; and in Stearns the substitution of a journal-bearing arm fast to the journal for the friction-roller and pin, and in both in making the boxes open.

The purpose of these improvements, and the results produced by them, are the same in Exhibits 1 and 2, namely, in view of Lapham, to hold the rocker on each side instead of on one side; the
82 result of which is to hold it practically in the exhibits, and not in Lapham, and, in view of Stearns and Barnum, to take all wear, except that characteristic of journals, from the pin, the result being a very much better machine, substantially different from either Stearns or Barnum.

In view of the state of the art, then, and considering only the substantial differences between Exhibit No. 1 and Lapham, Barnum, and Stearns, I find in Exhibit No. 2 all these substantial differences, and therefore I have no doubt that Graham's improvement, considered as a whole, is substantially embodied in Exhibit No. 2.

Int. 8. Now make the same comparison, but with regard to the description and specifications of claim in the re-issue patent.

Ans. I find, in the various mechanisms referred to in the question, rockers and beds substantially alike; but find in Exhibits 1 and 2 only, loose journals extending each side of the picker-staff, arranged beneath the picker-staff, and performing the same functions in substantially the same way.

I find in Exhibits 1 and 2 only, combined with the rocker, bed, and journal, open boxes, and they perform the same functions in substantially the same way.

I find in Exhibits 1 and 2 only, a journal-bearing arm combined with the rocker and its bed; and they perform the same functions in substantially the same way.

Int. 9. Compare the several mechanisms shown in the drawings now produced, and marked Exhibits Sleeper, 1, 2, 3, and 4, N. A. P., ex'r, respectively, Exhibits Nos. 1 and 2, with Barnum, and state the substantial difference, if any, between the several methods shown of connecting the rocker and the bed.

Ans. Barnum's wear comes on a pin, and would be a constant sawing friction of the rocker against the pin, eventually cutting it off and rendering the mechanism useless.

In the other mechanisms the sawing wear is taken from the pin by means of arms bearing journals. The latter mechanisms would last a long time, while Barnum's would soon be destroyed; and, compared with these, in my opinion, Barnum's motion is comparatively worthless.

In the mechanisms shown in the drawings, and in Exhibits 1
83 and 2, the wear is all taken from the journals or pins, (except, of course, the wear to which all journals are subject from their journal-motion,) and thrown upon the arms. The arms are worn in a slightly different manner in all the six, but the differences are, in my opinion, immaterial, and result in each case from the position of the arms.

Int. 10. Now make the same comparison between the two mechanisms shown in "Exhibit Sleeper, No. 5, N. A. P., ex'r," now produced.

Ans. In the mechanism shown when the dotted arms are left out, a pin extends from each side of the rocker through slots in the ears. When the pins move in the slots in the ears the wear is precisely the same as in Barnum's; and the method of connecting the rocker and bed does not substantially differ from Barnum's. But when the pins become journals, by being secured to the ends of the dotted arms, and are left free to revolve in the rocker, or secured to the rocker, and left free to revolve in the boxes in the ends of the arms, this wear is taken from the pins and thrown upon the end and sides of the arms, and the method of connecting the rocker and the bed is substantially the same as in the mechanisms shown in Sleeper, 1, 2, 3, and 4, and in the Exhibits No. 1 and No. 2.

Adjourned to 20th instant, at 10 a. m.

APRIL 20TH, 1868.—Resumed.

Int. 11. Compare Exhibits Sleeper, Nos. 6, 7, and 8, now produced, with Barnum's mechanism, and with Exhibits No. 1 and No. 2, N. A. P., and state their substantial identity or difference, giving your reasons. In all the exhibits, Sleeper, Nos. 6, 7, and 8, the journals are fast to the arms and project each side of the picker-staff, there being a second arm like the one shown on the other side of the motion; and in Nos. 6 and 7 the journals fit in boxes in the rockers, substantially as the journal in Exhibit No. 2, except that the boxes are not open.

Ans. No. 6, 7, and 8 differ substantially from Barnum just as Mason and Graham (Exhibits No. 2 and No. 1) differ from Barnum, namely,
they have each loose journals and journal-bearing arms instead
84 of pins; for, when the pin is fast to the arms or sliding ears, and
fits in a journal-box in the rockers, it necessarily becomes a journal. There is no substantial difference between Nos. 6, 7, and 8 and Exhibits 1 and 2, (Graham and Mason,) except that the former have not open boxes.

Int. 12. What substantial difference does it make whether the journals be connected directly to the rocker and indirectly (that is, by means of the arm) to the bed, or vice versa; or whether the pin be fast to the bed and in a slot in the rocker, or vice versa? Refer, if you desire, to any of the exhibits in the case.

Ans. It makes no substantial difference whatever in either case, as will be obvious from a comparison of the various motions in the case. In Stearns, Barnum, Graham, and Exhibits Sleeper, 1, 2, 8, and 10, (the latter of which I now produce,) the curve described by the point in the rocker in contact with the pin or journal at the beginning of its motion is of the same general nature in all. So in Mason and Exhibits Sleeper, Nos. 3, 4, 5, and 7, the centres of the journals or of the pin move in an arc of a circle; and in Exhibits Sleeper, No. 6 and No. 9, (which is now produced,) in a vertical line; but each rocker has its own peculiar motion, differing slightly from the motion of the others, but practically the same in effect.

Any mechanic of ordinary skill could readily change Barnum's mechanism, for instance, so as to make the pin move in the arc of any required circle, or in a straight or irregularly curved line, by making the pin fast to the rocker and a suitable slot in the ears; or in any of these rockers he could easily change the pin or journals from the rocker to the bed, or vice versa, without any substantial change in the mechanism.

Int. 13. Now, state whether, in your opinion, the various journal-bearing arms shown in the various exhibits referred to in your last an-

swer are or are not substantially the same. And, if yea, state fully your reasons for not regarding the various differences between them as substantial.

Ans. As I have before stated, I have no doubt that all these journal-bearing arms are substantially the same, because each is obviously a journal-bearing arm; each connects the journals positively to the
85 rocker or the bed, (in those cases where the journals are connected directly to the rocker, the arm connects them indirectly with the bed, and in those where the journals are connected directly with the bed it connects them indirectly with the rocker;) each compels the journal-operation of the journals; and each takes all the wear off the journals, except that characteristic of journals upon itself. In fact, after careful consideration, I can discover no difference whatever between any of these arms, except in form and the manner of their arrangement.

If Graham's invention had consisted in a mere form of journal-bearing arm, I should, of course, have no doubt that Mason's and many of the others did not embody his invention, and were, therefore, substantially different; or, if his invention consisted in the manner of arranging the arm, that is, in a slot in the rocker, I should have no doubt that Mason, or the mechanism shown in Sleeper, Nos. 6, 7, and 8, were substantially different, as not embodying his invention; or, if his invention consisted simply in arranging the arm in a vertical slot inside the rocker, I should not regard any of these mechanisms as substantially the same.

But, as I have no doubt that Graham's mechanism is the first in which a journal-bearing arm was ever used, and that its use produces certain beneficial results, I consider every combination of rocker, bed, and journal-bearing arm, where the use of the arm produces the same beneficial results exactly, as a plain appropriation of this part of his invention, without regard to the form or arrangement of the arm.

But I do not wish to be understood as asserting that Mason's method of connecting his arm with the bed is the same as Graham's method of connecting his arm with the rocker; for I have no doubt that Mason's method is better, as will be obvious by a comparison of Exhibits Sleeper, Nos. 6, 7, and 8, where Mason's method is shown in No. 7, and Graham's in the other two; for when the arm slides in ways, it is obvious that there is more wear and more friction than when it is connected as in No. 7; and for this reason I have no doubt that No. 7 is preferable to either No. 6 or No. 8. Either, however, would work practically and well.

Adjourned till Monday, 27, at 12.30.

86 Resumed.

Int. 14. Look at the model now shown you (marked Exhibit N, W. H. B., notary public) and state what it shows—considering first the long piece to be used; second, the short piece.

Ans. It shows, with some trifling variations which are immaterial, the mechanism described in the Graham & Rouse re-issue patent; that is, when the long piece is used. When the short piece is used, it makes a mechanism substantially the same as that shown in the model marked "Exhibit J, W. H. B., notary public." But it would be an improvement upon that mechanism, as the pin is placed so that the ends can revolve in open boxes.

Int. 15. Compare the exhibits now shown you, marked "Exhibit M, W. H. B." and "Exhibit No 4, N. A. P.," with the mechanism described

and shown in Lapham's patent, marked "Exhibit D, W. H. B.," and state which is a more correct representation of, and how they each compare with, that mechanism.

Ans. The exhibit marked "4, N. A. P.," is more correct in its proportions, as compared with the rocker-motion shown in the drawing, than in Exhibit N, and the arm more nearly corresponds in thickness to that shown in the drawing, (considering the drawing one-sixth of the full size,) although it is much thicker, fully twice as thick, proportionally, as the drawing, whereas that in Exhibit M is four times as thick, at least, which would make a substantial difference in the operation of the two mechanisms. The difference in the size of the two journals would also make a substantial difference, and that in Exhibit No. 4 more nearly corresponds with the drawing. The arm in 4 is placed nearer the position on the bed, and on the rocker shown in the drawing, than the arm in M, and would cause as much slip of the rocker on the bed as that in the drawing; but in M the arm is proportionally longer, and the ends are affixed much nearer the level of the bed; a position which is much better than, and substantially different from, that in the drawing, as it is obvious that the nearer the arm approaches the vertical, the more constrained the motion of the rocker will be.

87 Int. 16. Look at the Exhibit B, W. H. B., now shown you. State if you understand the rocker-mechanism there described and shown, and state how you understand that part of the description on the second page beginning, "The upper ends of the picker-staffs in any improved loom," and ending, "Besides, this mode of connection would not admit," etc., etc.

Ans. I have examined the rocker-mechanism therein described and shown, and understand its construction and operation. To my mind the description in the paragraph referred to is ambiguous, and may mean several different things, and I am utterly unable to determine which of these things is meant. For instance, the term "jointed link" conveys to me the idea of a link of two pieces jointed together, and the mechanism described, taking this to be the true meaning, would be such as that shown in the drawings now produced and marked Sleeper 11 and 12, N. A. P., ex'r, where the rocker is connected with the bed by "two jointed links." These "jointed links" are also "jointed metallic straps, and are "jointed at one end to the rocker, and at the other to the bed;" they would also cause the rocker to slide on the bed, and would not admit of very rapid motion.

In view of the state of the art at the date of Reynold's patent, and considering the words "metallic straps" to be explanatory merely of the words "jointed links," (of which, however, I am by no means sure,) Lapham's motion would seem to be referred to, as that has one metallic strap jointed at one end to the rocker, and at the other to the bed, which causes the rocker to slide greatly, and which certainly will not admit of rapid motion. I should not, however, think of describing Lapham's strap as a "jointed," but rather as a plain link.

Or, again, Reynolds may have meant to describe a motion in which two of Lapham's straps are used jointed to the ends of the rocker instead of to the middle, shown roughly in the model now produced, marked Exhibit No. 9, N. A. P., ex'r, which would answer his description exactly in every respect except one, namely, the rocker would not slide on its bed.

In my opinion, he could not have meant to describe a mechanism in which the rocker was held on its bed by means of journals projecting from each side of the rocker and of the bed, and connected by two

88 metallic straps, each like Lapham's, but lying each side of the rocker, for this means of connecting the rocker with the bed would cause only a very slight and utterly immaterial slide of the rocker upon its bed, provided the straps were arranged in a proper position, as in Exhibit 2, N. A. P., ex'r, or as in Exhibit O, W. H. B., ex'r, and would admit of a far more rapid motion than the other parts of any loom, and far more rapid than the motion Reynolds described in his specification and drawings.

Int. 17. Would the mechanism shown in Exhibit Sleeper, Nos. 11 and 12, and in Exhibit No. 9, be substantially similar to or different from the mechanism described in Graham and Rouse re-issue patent, and state your reasons?

Ans. They are substantially different from the mechanism described in the Graham and Rouse re-issue patent, for substantially the same reasons that I have given in my comparison of Lapham with the re-issue patent. I do not mean to assert that these mechanisms are substantially the same as Lapham's, and, in my opinion, they are decidedly better than Lapham's. But neither of them have journals projecting from each side of the rocker or open boxes or journal-bearing arms.

Int. 18. Compare Exhibit No. 8, N. A. P., ex'r, with Exhibit No. 2, Exhibit H, and the mechanism described in the Graham and Rouse re-issue, and state their substantial identity or difference, giving your reasons; bear in mind and refer to, if you please, the mechanism of Stearns, Barnum, and Lapham.

Ans. Exhibit 8 is obviously precisely like Exhibit No. 2 in every respect except one, namely, the arrangement of the journal-bearing arm. This difference in arrangement creates no practical difference whatever in the operation of the mechanism; it is simply and entirely a change in the arrangement of the elements of the combination, but the elements themselves are precisely the same, operate in substantially the same way, and produce substantially the same result. The only difference I can discover between Exhibit 8 and Exhibit 2 is this: that in the first the arm is connected to the bed by means of ways in which it plays up and down, and in Exhibit 2 it is connected to the bed by means of
89 a journal-box, in which one part of the arm can turn, and the only practical effect of this difference is to produce friction upon the arm, and its consequent wear, thereby making Exhibit No. 2 a rather better mechanism, but substantially the same mechanism as Exhibit No. 8.

The same comparison exactly may be made between Exhibits Nos. 8 and H, as Exhibit H does not differ from Exhibit 2 except that in Exhibit H the superfluous parts of the journal-boxes, namely, those which prevent the backward motion of the rocker upon its bed, (that is, the motion from the loom,) are dispensed with, and the spring alone is relied upon to prevent this motion. Of course, if the arm in Exhibit H was connected with the bed by means of ways, as in No. 8, these portions of the boxes must either be replaced or a spring must be attached to the arm to pull it down.

Exhibit No. 8 differs from the mechanism described in the Graham and Rouse re-issue, first, in the form of the arm, and consequently in the method of connecting it to the journals and to the bed; and, second, in the fact that the journals are connected directly with the rocker and indirectly with the bed by means of the arm instead of vice versa.

Instead of connecting the arm to the inner ends of the journals, thereby necessitating the lacing of the arm in a slot in the rocker or the bed, and the projection of the journals from each side of the arm out-

wards, the arm is divided and connected to the outer ends of the journals, thereby necessitating the placing of the rocker or bed between the arms and the projection of the journals from each arm inwards. This I regard as a mere change in form, not affecting in any way the operation of the mechanism. Whether the journals shall be connected directly with the bed and indirectly (by means of the arm) with the rocker, or vice versa, is, in my opinion, a mere matter of choice in the construction of the mechanism. I have no doubt, therefore, that Exhibits Nos. 8, 2, and H do not differ in any substantial respects whatever from the mechanism described in the Graham and Rouse re-issue patent, and that each contains all the combinations specified in the claims.

And in view of Lapham, I have no doubt that each of these exhibits embodies substantially the same improvement upon Lapham,
90 namely, extending the journals each side of the picker-staff, placing them in open boxes, and attaching the journals instead of their boxes to the arm, which are precisely the improvements upon Lapham (regarding his mechanism, if possible, as capable of operation) embodied in the mechanism described in the Graham and Rouse re-issue patent. And in view of Stearns and Barnum, I have no doubt that each of these exhibits embodies substantially the same improvements upon them, namely, compelling the pin to become journals, thereby taking all the wear off the pin except that wear characteristic of a journal, placing them in open boxes and attaching them to an arm, which are precisely the same improvements upon Stearns and Barnum that are embodied in the mechanism described in the Graham and Rouse reissue patent.

Adjourned to 28th, at 10.30 a. m.

Resumed.

Int. 19. State whether, in your opinion, the arm G in Graham's device does or does not connect the journals with the rocker. And before answering look at the answer to the forty-first cross-interrogatory in the deposition of Henry B. Renwick.

Ans. I should say it did; for the arm G on which the rocker slides compels the journal-motion, and, were a portion of it removed, as shown in the short journal-piece in Exhibit N, W. H. B., no certain journal-motion could be acquired by the remaining parts.

Int. 20. State whether you find in both Exhibits No. 2, N. A. P., and Exhibit H, W. H. B., "journals projecting each side of the picker-staff and arranged beneath the picker-staff" substantially, and give your reasons. Before answering refer to the answer to the fortieth cross-interrogatory in the deposition of Henry B. Renwick.

Ans. The bearings to which the journals are made fast are on each side of the rocker, and the journal from them extends from one side to the other side of the rocker, which is substantially the same as if the journals were made fast to the rocker, and the journal-motion was upon their ends. In both H and I there are substantially two journals,
91 one projecting from each side of the rocker just as in Graham's, as will be obvious if we suppose Graham's journals fast in the ears, as in Barnum's, and connected by a cylindrical shaft which passes through the arm and on which the arm turns. It will also be obvious, from an examination shown in Sleeper 6, 7, and 8, in all of which it is plain that the journals might turn in the sliding ears or arms, instead of being fast to them and turning in the rocker. They are beneath the picker-staff. I understand by beneath the picker-staff, not directly underneath

it, but below it and beneath its throw, that is, beneath the line of its motion on the upper end.

CHA'S F. SLEEPER.

Charles M. Keller, of counsel for respondent, declines to cross-examine.

92 *Deposition of Wanton Rouse.*

APRIL 24, 1868.

Int. 1. State your name, age, residence, and occupation.

Ans. Wanton Rouse; age, forty-seven; residence, Taunton, Mass.; occupation, superintendent of the Eagle Cotton Company's mill.

Int. 2. Are you one of the complainants in this case?

Ans. I am.

Int. 3. State what experience you have had in weaving cotton.

Ans. At the age of ten years I worked in a cotton-mill, and have continued working in it ever since, and for the last twenty-three years have been superintendent of cotton-mills. During this time I have worked in various parts of the mill, such as overseeing and managing. The principal part of my time, previous to the last twenty-three years, was spent in spinning and carding departments. I have been engaged in various parts of the country: in Plainfield, and Thompson, and Killingly, Connecticut, and Taunton, Mass.

Previous to the last seven years I was also employed in the manufacture of cotton-machinery, and in planning cotton-mills for various parts of the country. In this capacity I have been called upon to plan and construct almost all kinds of machinery used in cotton-mills, including looms.

Int. 4. Are you acquainted with the several methods in use, during the last twenty or thirty years, for throwing the shuttle in cotton-looms? if so, state generally what methods were in use during that time.

93 Ans. I am. My first recollection is of what is called the wag-staff, so called, attached in the middle of the loom, with picker-strings attached to the top of the wag-staff, and extending each way to the end of the lathe, where they were attached to the pickers for throwing the shuttles.

The next is the Perry picker motion, like "Exhibit No. 4, N. A. P., ex'r," now produced.

I have also seen a motion in use called the Dutcher motion, which I consider very similar to the Perry motion, and which is shown in the sketch now produced, marked "Exhibit Dutcher, N. A. P., ex'r."

The Perry and Dutcher motions have been those most in use, until the Stearns motion was introduced.

I have occasionally seen a rocker motion in use, but none in successful use, with the exception of those on what is called the Empire loom, described in Reynolds' patent, (defendant's "Exhibit B, W. H. Bishop, not. pub.") There was very little use of the rocker motions, excepting the Empire, until the Drapers began to manufacture Stearns. The rocker and bed is an old motion, but there seems to be a difficulty in finding a way to hold the rocker in its position practically; and, so far as my knowledge extends, the rocker motion was laid aside or given up, except what little use the Empire made of it, until the Stearns motion came up, which took the place of the Perry and had a great run. The

wards, the arm is divided and connected to the outer ends of the journals, thereby necessitating the placing of the rocker or bed between the arms and the projection of the journals from each arm inwards. This I regard as a mere change in form, not affecting in any way the operation of the mechanism. Whether the journals shall be connected directly with the bed and indirectly (by means of the arm) with the rocker, or vice versa, is, in my opinion, a mere matter of choice in the construction of the mechanism. I have no doubt, therefore, that Exhibits Nos. 8, 2, and H do not differ in any substantial respects whatever from the mechanism described in the Graham and Rouse re-issue patent, and that each contains all the combinations specified in the claims.

And in view of Lapham, I have no doubt that each of these exhibits embodies substantially the same improvement upon Lapham,
90 namely, extending the journals each side of the picker-staff, placing them in open boxes, and attaching the journals instead of their boxes to the arm, which are precisely the improvements upon Lapham (regarding his mechanism, if possible, as capable of operation) embodied in the mechanism described in the Graham and Rouse re-issue patent. And in view of Stearns and Barnum, I have no doubt that each of these exhibits embodies substantially the same improvements upon them, namely, compelling the pin to become journals, thereby taking all the wear off the pin except that wear characteristic of a journal, placing them in open boxes and attaching them to an arm, which are precisely the same improvements upon Stearns and Barnum that are embodied in the mechanism described in the Graham and Rouse reissue patent.

Adjourned to 28th, at 10.30 a. m.

Resumed.

Int. 19. State whether, in your opinion, the arm G in Graham's device does or does not connect the journals with the rocker. And before answering look at the answer to the forty-first cross-interrogatory in the deposition of Henry B. Renwick.

Ans. I should say it did; for the arm G on which the rocker slides compels the journal-motion, and, were a portion of it removed, as shown in the short journal-piece in Exhibit N, W. H. B., no certain journal-motion could be acquired by the remaining parts.

Int. 20. State whether you find in both Exhibits No. 2, N. A. P., and Exhibit H, W. H. B., "journals projecting each side of the picker-staff and arranged beneath the picker-staff" substantially, and give your reasons. Before answering refer to the answer to the fortieth cross-interrogatory in the deposition of Henry B. Renwick.

Ans. The bearings to which the journals are made fast are on each side of the rocker, and the journal from them extends from one side to the other side of the rocker, which is substantially the same as if the journals were made fast to the rocker, and the journal-motion was upon their ends. In both H and I there are substantially two journals,
91 one projecting from each side of the rocker just as in Graham's, as will be obvious if we suppose Graham's journals fast in the ears, as in Barnum's, and connected by a cylindrical shaft which passes through the arm and on which the arm turns. It will also be obvious, from an examination shown in Sleeper 6, 7, and 8, in all of which it is plain that the journals might turn in the sliding ears or arms, instead of being fast to them and turning in the rocker. They are beneath the picker-staff. I understand by beneath the picker-staff, not directly underneath

it, but below it and beneath its throw, that is, beneath the line of its motion on the upper end.

CHA'S F. SLEEPER.

Charles M. Keller, of counsel for respondent, declines to cross-examine.

92 *Deposition of Wanton Rouse.*

APRIL 24, 1868.

Int. 1. State your name, age, residence, and occupation.

Ans. Wanton Rouse; age, forty-seven; residence, Taunton, Mass.; occupation, superintendent of the Eagle Cotton Company's mill.

Int. 2. Are you one of the complainants in this case?

Ans. I am.

Int. 3. State what experience you have had in weaving cotton.

Ans. At the age of ten years I worked in a cotton-mill, and have continued working in it ever since, and for the last twenty-three years have been superintendent of cotton-mills. During this time I have worked in various parts of the mill, such as overseeing and managing. The principal part of my time, previous to the last twenty-three years, was spent in spinning and carding departments. I have been engaged in various parts of the country: in Plainfield, and Thompson, and Killingly, Connecticut, and Taunton, Mass.

Previous to the last seven years I was also employed in the manufacture of cotton-machinery, and in planning cotton-mills for various parts of the country. In this capacity I have been called upon to plan and construct almost all kinds of machinery used in cotton-mills, including looms.

Int. 4. Are you acquainted with the several methods in use, during the last twenty or thirty years, for throwing the shuttle in cotton-looms? if so, state generally what methods were in use during that time.

93 Ans. I am. My first recollection is of what is called the wag-staff, so called, attached in the middle of the loom, with picker-strings attached to the top of the wag-staff, and extending each way to the end of the lathe, where they were attached to the pickers for throwing the shuttles.

The next is the Perry picker motion, like "Exhibit No. 4, N. A. P., ex'r," now produced.

I have also seen a motion in use called the Dutcher motion, which I consider very similar to the Perry motion, and which is shown in the sketch now produced, marked "Exhibit Dutcher, N. A. P., ex'r."

The Perry and Dutcher motions have been those most in use, until the Stearns motion was introduced.

I have occasionally seen a rocker motion in use, but none in successful use, with the exception of those on what is called the Empire loom, described in Reynolds' patent, (defendant's "Exhibit B, W. H. Bishop, not. pub.") There was very little use of the rocker motions, excepting the Empire, until the Drapers began to manufacture Stearns. The rocker and bed is an old motion, but there seems to be a difficulty in finding a way to hold the rocker in its position practically; and, so far as my knowledge extends, the rocker motion was laid aside or given up, except what little use the Empire made of it, until the Stearns motion came up, which took the place of the Perry and had a great run. The

next motion I saw was Graham's, and this one, (defendant's "Exhibit L,") which I invented myself. Afterwards Mason began to manufacture motions like mine—just like this, (Exhibit L,) and shortly after motions like this, ("Exhibit No. 2, N. A. P.") I have seen the motions in Manchester, New Hampshire, where they were experimenting upon different plans for holding the rocker to the bed. One was by a flat spring, one end of which was connected to the bed and the other to the rocker, like the leather in Reynolds', ("Exhibit K, W. H. B.") Another method was horns cast at each end of the bed, projecting upwards, and a rocker having trucks at each end, that is, friction-rollers on pins, working against the surface of these two horns. I have also seen a rocker
94 with teeth running in a rack to hold it in position, like that shown in "Exhibit A, W. H. B."

Int. 5. Which of the motions, if any, above mentioned do you regard as practically successful ones?

Ans. Well, I must say I consider the Mason motion, with a short link, ("Exhibit No. 2, N. A. P.,") superior to any of them, taking the cost of manufacture, and their operation, into consideration. The motion invented by myself ("Exhibit No. 3, N. A. P.") is the next best motion. This works equally as well in every way as Mason's, ("Exhibit No. 2,") but costs a great deal more to make it up, because the journals are milled up, and the boxes bored out; whereas in the Mason the journals and boxes are cast; the boxes being cast open, and the journals to drop in, not requiring the boxes to be bored out, or the journals to be milled up. The next best motion, in my opinion, is the Graham motion, described in Exhibit No. 1, on account of having the journal for holding the rocker in its position as in the others, and as being about as cheap as Mason's in construction, and operating pretty near as well as Mason's, but requires a little stiffer spring to hold it down. There is another motion which I forgot to describe in my last answer—the Bean motion—which has a rocker and a bed connected by a long link, as shown in the sketch now produced, and marked "Exhibit Bean, N. A. P." I never had experience of its working on a loom, but I have seen the motion, and examined it, and shouldn't think it a very good motion, because the spring would not throw the rocker back with any certainty, as I should judge. After the Graham motion I consider the Stearns the best; and after that the Reynolds, when arranged for his peculiar looms; but this is not adapted to other looms. I don't consider any of the other rocker motions practical at all.

Int. 6. What was the first motion that you ever knew in which the rocker was combined with the bed by means of a journal?

Ans. The first I ever knew was one that I constructed myself, like Exhibit L, W. H. B.; but, soon after I constructed this, Mr. Graham came along to our place with a motion like Exhibit No. 1, which he said was patented.

95 Int. 7. What arrangement did you make with Graham, if any; what advice did you take, if any, and what were your reasons for making the arrangement?

Ans. Seeing that his motion embodied the same principle for holding the rocker in its position by a journal as mine, and that he had a patent on his, and both of us considering that my motion was the best, we entered into an arrangement whereby we became joint owners in his patent by holding the rocker by this journal. Accordingly we took advice in Boston of Mr. Gavett, solicitor of patents, who had drawn Graham's patent, and he said that Graham's claims covered my construction, and drew up an agreement for us to sign, and had it recorded in Wash-

ington. I entered into this arrangement, because I considered that our means for holding the rocker in its position, the journal, was substantially the same, as I believed Graham to be the first man who ever used a journal to hold the rocker on its bed, and still believe so, although I've been so long in the business, and visited a great number of mills in the Northern and Middle States, and think I've seen about all the shuttle motions that have been in use.

Int. 8. Produce, if you please, and annex the agreement signed by Graham, just referred to by you.

Ans. I produce it, marked "Exhibit Rouse and Graham, N. A. P."

Int. 9. When this arrangement was made, did you know anything about Lapham's patent, (Exhibit D., W. H. B.;) and state why you do not regard Lapham as being the first man to combine a rocker with a bed by means of a journal.

Ans. I did not. I don't consider him the first man to make this combination, because, after examining the draft of the rocker shown in his patent, and a model of the same, I don't see any intention of his making use of this means. He has attached to his arm a yoke, as he calls it, in such a manner that it will not work.

Int. 10. What do you understand to be the difference between Graham's motion and Lapham's, in their practical operation?

Ans. The Lapham is so constructed that it will not allow the picker-staff to oscillate the required distance to throw the shuttle.
96 That will not operate practically as a motion, and Graham's will operate as a motion.

Int. 11. Did you ever use Graham's motion, as described in his patent? I mean with the journal-bearing arm extending up in a slot in the rocker. If so, how did it operate; and did you use more than one motion, and how long did you use it?

Ans. I have used it as described, on a loom in our mill, in weaving cotton; that is, I used one motion, no more, for several months. It worked well, and did what was required of it.

Int. 12. How long ago was this, and what were your reasons for using that form of Graham's motion?

Ans. It was in 1861. I used it to test its operation.

Int. 13. Why did you cease using it, and what did you put in its place?

Ans. I ceased because I considered the one of my construction to be better, and put one of my own construction in its place, as I had the right to use either under our agreement.

Int. 14. Did you ever see, before you made your motion, or hear of, any rocker motion of any kind in which the rocker was confined to its bed by a journal or journals; and did you ever see or hear of anybody else who ever had seen or heard of such a motion?

Ans. None whatever. That I am positive of.

Int. 15. Now state, if you please, just what practical difficulties there are in the rocker motion shown in Lapham's patent.

Ans. First. I find in the Lapham motion an arm attached so high up on the rocker at one end of the arm, and so low down on the bed at the other end of the arm, that it will not allow the rocker to oscillate the distance required to throw the shuttle. And this manner of attaching the arm creates another difficulty, namely, the arm comes into position to force the rocker down on to the bed so hard as to create a great sliding motion to the rocker, and friction also, and such a heavy strain upon the arm and journals that they would soon wear out, and the whole thing would be totally impracticable for throwing the shuttle.

Second. This arm is attached on one side of the rocker, and
97 being so thin, I see nothing to prevent the rocker from wabbling practically. (By the arm being thin, I mean, it has so little length of bearing on the journals.) The practical importance of a long bearing on the journals will be seen in the exhibit which I now produce, and which has been run. ("Exhibit No. 5, N. A. P., ex'r.") By actual measurement of Lapham's draft, and a working-loom, I find the drawing to be one-sixth of full size, which would make his yoke *b*, or arm, between three-sixteenths and one-fourth of an inch thick, and the bearing on the journals cannot possibly be more than one-fourth of an inch. In Exhibit No. 5 the bearing is one and seven-eighth inches wide. It is evident, from Exhibit No. 5, with journals on one side only, which are worn, as seen, that Lapham's journals, on one side only, with their bearing, would be totally unable to resist the wear for even a short period of time.

Third. I see no spring attached to bring the rocker and staff to its first position to throw the shuttle, but he relies wholly upon the force of the shuttle to throw the staff back into its proper position to give the next throw to the shuttle, which is a very uncertain method; and, if it don't throw the staff back, it fails to throw the shuttle across the loom the next time, and the loom stops. Every rocker motion, I know, has some means for throwing the staff back without relying on the shuttle.

Int. 16. Did you ever use the Stearns motion? If so, when, how many, and how did they operate?

Ans. I have used one for about two months; I think about 1861. After running a short time, it began to wabble, and throw the shuttle out of the loom. My overseer complained of its doing so, and, after several weeks' use, took it off, without my knowledge at the time.

Int. 17. Are you familiar with the way that the Stearns motion operates, and do you know how they are now constructed?

Ans. I am, having seen them running in various mills. I know how they are now constructed.

Int. 18. Have you seen a Stearns motion containing a pin on which was a friction-roller for the hawk-bill to rub against?

98 Ans. I don't remember that I ever have, except in the model here shown. (Exhibit J, W. H. B.)

Int. 19. Do you know what is used commonly in the Stearns motion instead of that friction-roller and pin?

Ans. I have seen them running, quite a number of them, with the hawk-bill, so called, rubbing and chafing directly against the front side of the slot in the bed, which was cast rounding for that purpose. I have also seen them running with an iron plug, like Exhibit 6, N. A. P., here shown, and put in as the wooden plug is now put in to Exhibit 7; and I've been told by two of the principal manufacturers, Draper & Whiting, that they used the wooden plug now, like that in Exhibit No. 7.

Int. 20. Do you know the purpose of the flat piece projecting upward from the bed through a slot in the rocker in Exhibit No. 7?

Ans. Well, seeing nothing to practically prevent it from wabbling in the bearing of the hawk-bill on the plug, and seeing this projection from the bed up through the rocker, I can conceive it to be for no other purpose than to prevent wabbling.

Int. 21. What would be the practical operation of the friction-roller and pin in Stearns' motion?

Ans. If the friction-roll could be made certainly to turn by the friction of the hawk-bill upon it, it would relieve the friction and wear of the

motion in a manner to work with much less power and much greater certainty of throwing the shuttle every time alike, than rubbing on this plug (in Exhibit 7.) But as there is nothing to turn this friction-roll except the rubbing of the hawk-bill upon it, it would be likely to stop, and not turn, a greater part of the time. And I have no doubt that a large portion of the rollers stop altogether from friction of the roller on the pin being greater than that of the hawk-bill on the roller. So that the practical operation of the roller becomes just like a pin, as in Barnum's.

Int. 22. Did you alter a mechanism like Exhibit No. 2? If so, produce the mechanism so altered, and state when it was altered, and what has been done with it since.

Ans. I produce this. (Exhibit No. 8, N. A. P., ex'r.) I altered
99 this about two weeks since. I have had it working on a loom for about ten days in all. Within the two weeks I sent it to J. E. Maynadier, esq., and he returned it to me, and it has been in operation until last evening, (April 23,) when I took it off to bring up here with me.

Int. 23. Why did you cut the journal-bearing arm in two?

Ans. I filed off the edges of the arm for the purpose of having it slide in-ways in each side of the rocker. I cut off the bottom part of the arm so as to clear the floor, so as to let it operate.

Int. 24. State how this worked, compared with Stearns and Graham.

Ans. It worked better than the Stearns, and equally as well as Graham's. It is, in fact, just the same thing as Graham's reversed, the arm working in-ways in the bed instead of in a slot in the rocker. It worked much better than the Stearns motion, and with much less friction, having a straight instead of a round rubbing surface.

Int. 25. What is the bunch of leather on top of the staff in Exhibit No. 8, and what made the hole in one side of it?

Ans. The bunch of leather is for the purpose of striking the shuttle. It is what is called the picker; and the point of the shuttle made the hole in it.

Int. 26. What would be the practical objection to the rocker described in Barnum's patent, Exhibit E, W. H. B., and Exhibit F, W. H. B.?

Ans. The great objection would be its rubbing or sawing motion, and the friction on the pin, which would cut the pin off in a very short time. This method of connecting the rocker with the bed is, in my opinion, practically worthless, and I never saw any in use.

Int. 27. State whether, in your opinion, Exhibit No. 2 and Exhibit H are substantially the same, or substantially different from the motion described in the re-issue patent issued to you and Graham.

Ans. I find in both exhibits a journal attached to an arm, or double arm, and the journal attached to the rocker near its centre and beneath the picker-staff, and extending both sides of the picker-staff which
100 holds the rocker in its position on the bed. This journal drops into an open box in the rocker in the same manner that Graham's journal drops into a box in the bed. The use of this journal is for the same purpose as in Graham's, and operates practically in the same way.

Int. 28. What practical difference does it make in these motions whether the journal is stationary on the bed, as in Graham's, or moves in the arc of a circle, as in Mason's and in your motion, or in a straight line, as in No. 8?

Ans. I see no perceptible difference whatever.

Int. 29. Why do you regard Mason's and your mechanism as being the best in operation?

Ans. Because attaching one end of the arm to the outer end of the bed causes less friction than the sliding motion in Graham's or in No. 8. I mean the sliding motion on the arm. And also because it causes less wear upon the arm.

Int. 30. Did you ever see a mechanism like Exhibit O, W. H. B., in use? And what is the practical objection to that, if any?

Ans. I have never seen any of them in use, or heard that they were used. The practical objection, in my opinion, is that they would wear out much sooner than any other rocker motion with a journal, from the fact that the journal is attached to the extreme end of the rocker, where it has the greatest motion, instead of being attached to the centre, (like Exhibit H, W. H. B., and No. 2, N. A. P.,) where there is the least motion to the rocker, and because it requires a much stiffer spring to hold it down on the bed when the rocker is thrown forward, thereby using up power and causing wear upon the journals.

Int. 31. Compare Exhibit M, W. H. B., and Exhibit No. 4, N. A. P., with the mechanism described in Lapham's patent, Exhibit D, W. H. B., and state which is the more correct representation of that mechanism.

Ans. I find in No. 4 that the position of the arm or yoke, so called, is much nearer to the patent than it is in Exhibit M.

The yoke, or arm, in Exhibit M, is attached too low down on the rocker, and too high up on the bed, than in the patent. The yoke is made three times thicker in M than in the patent, and almost
101 twice as long, which goes so far to correct the difficulties in the patent. The yoke in No. 4 is one-half thicker than that in the patent, and of just the same length as that in the patent, but not quite as much inclined. The model Exhibit No. 4 is more likely to work than the mechanism shown in the patent.

Adjourned.

APRIL 28, 1868.

And in answer to cross-interrogatories, propounded to him by Cha's M. Keller, esq., deponent saith, as follows, viz:

Cross-int. 1. Where did you first see a Graham's picker-staff motion in use? I mean one constructed in all respects like the description in the patent.

Ans. I saw it at our mill in Taunton.

Cross-int. 2. When?

Ans. Some time in the latter part of the year 1860.

Cross-int. 3. Was that the one which you mentioned in your examination-in-chief as having used for about two months and then taken off and substituted by one of your own?

Ans. I think it was.

Cross-int. 4. Are the considerations named in the agreement marked "Exhibit Rouse and Graham," the only considerations given by you for the half interest which you acquired in the Graham patent?

Ans. They are.

Cross-int. 5. Before making that agreement, did you and Graham go into some inquiries to ascertain which had first invented the shuttle-motion, you or Graham?

Ans. I understood that he was the first inventor.

Cross-int. 6. As you understood that he was the first inventor, how could you expect to get a patent for yours?

Ans. I did not know but there might be some points considered to be different between the two inventions, not having at that time looked into the matter fully.

102 Cross-int. 7. Before executing the agreement, "Exhibit Rouse and Graham," had you not taken the opinion of Mr. Gavatt as to the substantial identity of your invention with the one described in Graham's patent?

Ans. I had,

Cross-int. 8. As it had been ascertained that Graham was the prior inventor, before the execution of the agreement "Exhibit Rouse and Graham," what consideration did Graham receive for the assignment to you of one-half of his patent?

Ans. He considered my motion, as I understood him, to be the best, and to save any controversy we entered into our agreement.

Cross-int. 9 In your opinion does it require the exercise of the inventive faculties to lengthen a journal and its box, when an experienced machinist finds that in any piece of mechanism they are too short and liable to strain laterally?

(Objected to.)

Ans. That would depend on whether he made use of it, somewhat

Cross-int. 10. Assume that he was going to make use of it, and with that assumption, answer the previous question.

Ans. If he used it any length of time, and found that it wore out soon, he might attribute it to the shortness of the bearing, if he saw nothing else to cause it to wear out so soon. Ordinarily it would not require the exercise of the inventive faculty.

Cross-int. 11. I understand you to have testified that Exhibit No. 4 is a correct representation of the picker-staff motion represented in the Lapham patent, Exhibit D. Do you mean by that to be understood that the link was to be connected with the bed by means of wood-screws?

Ans. I did not.

Cross-int. 12. By what means did you understand that the link was to be connected with the rocker and bed, looking at the patent as an experienced and skilful mechanic?

Ans. I should judge, by looking at the patent, that there were small pins driven into the rocker and bed, and the arm or link slipped on to the pins.

103 Cross-int. 13. Do you understand the drawing of the Lapham patent as being made in exact proportion, or as working-drawings, such as are made in machine-shops for the construction of machinery and directions to the workmen?

Ans: Understanding what the motion is to do, I should not direct it so made. If a skilful mechanic comprehended what it was to do, I should suppose he would construct it quite different if he intended to make practical use of it.

Cross-int. 14. I understand you to have stated that one of the defects in the picker-staff motion, represented in the Lapham patent, is that the link or yoke is connected with the rocker too high, and with the bed too low. Will you please to state whether it requires invention to change the points of connection, and where precisely the change of position requires invention?

Ans. It requires invention and experiment to find out the best position to place it in.

Cross-int. 15. Where are the two precise points, in your judgment, which require invention and experiment to discover?

Ans. The place on the rocker *is* at or near to where it has the least

motion. That place is near the bottom of the rocker, and near the centre of motion of the rocker, and beneath the picker-staff.

Cross-int. 16. Do you mean as represented in Exhibit 3?

Ans. I do mean that, or near to that, position.

Cross-int. 17. How far could you deviate from that, so that the change of position from what is represented in the Lapham patent would not require invention?

Ans. I cannot say.

Cross-int. 18. Will you point out, in the Graham and Rouse re-issue patent, where a link or links is or are connected by one end to the rocker and the other to the bed?

(Objected to on the ground that the patent will speak for itself.)

Ans. Looking at the re-issue, I find an arm with journals at one end, attached to the bed—which may be considered a link at one end, its journals holding the rocker in its position—this arm extending up into the rocker, allowing the rocker to slide on it instead of lying horizontally, and being connected to the bed by a journal.

104 Cross-int. 19. Do you find in the Graham and Rouse re-issue patent that the rocker is connected with the bed by means of a link or piece called by any other name, which is hinged or pivoted by one end to the rocker, and by the other to the bed?

Ans. I find what may be called a link pivoted to the bed, but not pivoted to the rocker, but allowed to slide in the rocker instead.

Cross-int. 20. Is not the axis of the pivoting, which connects the arm or link in the Graham and Rouse re-issue, the means by which the arm or link is connected with the rocker?

Ans. It is.

Cross-int. 21. Look at Exhibit No. 2 and state whether the axis of the pivoting, which connects the links with the bed, is not different from the axis which connects the links with the rocker.

Ans. It is in a different position.

Cross-int. 22. Which is the nearest to a horizontal line, the link which connects the bed and rocker in the Lapham patent or the journal-bearing arm in the Graham and Rouse re-issue?

Ans. The link or arm in the Lapham patent.

Cross-int. 23. In the Graham and Rouse re-issue, at every vibration does not the rocker have to slide on the arm?

Ans. It certainly does.

Cross-int. 24. In Exhibits No. 2 and No. 3, during any part of the rocking motion, does the rocker slide on the link or links?

Ans. It does not.

Cross-int. 25. During the vibrations, or rocking motion, does not the rocker slide on the bed in the Graham and Rouse re-issue and in Exhibit No. 2?

Ans. It does slide slightly in both, but more in Exhibit No. 2.

Cross-int. 26. Does not the rocker in the Lapham patent slide on the bed?

Ans. It does slide very much more.

Cross-int. 27. If you find in a piece of machinery that by the sliding of one part on another, the wear of the parts and the power required is too great, on account of the friction, do you not know, as a machinist, that you can greatly reduce the friction by introducing a friction-roller?

105 Ans. If that friction-roller is made sure to turn while there was great heft upon it, it would certainly reduce the friction.

Cross-int. 28. If the diameter of the roller is greater than the diame-

ter of its journals, and the moving body is in contact with the periphery of the roller, and the journals are properly fitted to boxes in the stationary body, must not the roller necessarily turn, if the workman has not made a botch of it?

Ans. Rollers turned by friction, in many cases in my experience, do not certainly turn. If the difference between the journal and the truck or friction-roller was very great, and kept lubricated, it would be very likely to turn.

Cross-int. 29. Have you ever seen Barnum's rocker motion in use?

Ans. No.

Cross-int. 30. What is, if you have ever computed it, the amount of pressure bearing on the roller in the Stearns picker-staff motion and on the pin in the Barnum picker-staff motion?

Ans. I never have computed it.

Cross-int. 31. Is the duty performed by the picker-staff, in driving the shuttle in a power-loom, any greater than the force exerted by the weaver in throwing the shuttle by the hand?

Ans. It is by the way picker-staffs are now constructed.

Cross-int. 32. Does it require any greater power to throw the shuttle in the power-loom than in the hand-loom?

Ans. Not any more, if both are thrown at the same speed, I should think.

Cross-int. 33. To the best of your judgment, about how many pounds pressure is exerted on the journals in the Graham and Rouse re-issue patent, at the time of throwing the shuttle, or on the ends of the links in the Mason picker-staff motion?

Ans. I never have weighed it, but I should think it would raise a ten-pound weight. If the staff should hit you, I know you would feel it.

Cross-int. 34. Do you understand Exhibit No. 7 to have been made in strict accordance with the Stearns patent?

Ans. It is not.

106 Cross-int. 35. Look at Exhibit L and state by whom it was manufactured.

Ans. I suppose it was manufactured under the orders of E. H. Graham.

Cross-int. 36. Have many such been manufactured under his orders, or for him, or by his direction?

Ans. That I could not tell. He has been round introducing them, but how many he has put into operation I cannot tell.

Cross-int. 37. How many have you seen in operation having the journal-bearing arm fitted in a socket in the rocker, as described in the Graham and Rouse re-issue?

Ans. I have seen only one.

Cross-int. 38. Does the re-issue patent of Graham and Rouse describe the journal-bearing arm as being square, with one side flush with the side of the rocker, as represented in Exhibit No. 1?

(Objected to on the ground that the patent will speak for itself.)

Ans. I should think not.

Cross-int. 39. Look at Exhibit G and state whether it differs from Exhibit No. 3 in any respects; and, if yea, in what respect.

Ans. All the difference I see in the two exhibits is that the socket of the picker-staff sets a little more one side in No. 3 than in Exhibit G.

Cross-int. 40. Do the bearing-surfaces of the journals in Exhibit G extend both sides of the centre of the picker-staff?

Ans. It might be said that it does not, but it amounts to about the same, I should think.

Cross-int. 41. Do you not know that the entire length of the bearing-surface of the journals in Exhibit G is on one side of the central line of the picker-staff?

Ans. It is.

Cross-int. 42. In Exhibit No. 3 is not the whole thickness of the picker-staff between the two ends of the bearing-surface of the journals?

Ans. Yes.

Cross-int. 43. Does it make any material difference whether the
107 picker-staff be placed relatively to the length of the journals, as in Exhibit G or as in Exhibit No. 3?

Ans. The journals in Exhibit No. 3 will wear longer.

Cross-int. 44. Does that constitute a substantial difference in the principle or mode of operation of the two devices, Exhibit G and Exhibit No. 3?

Ans. No difference in the mode of operation except wear, the principal difference being only that the journals are each side of the picker-staff in Exhibit No. 3.

Cross-int. 45. Is that difference a difference in degree or a difference in principle?

Ans. I should call it a difference in degree of usefulness.

Cross-int. 46. Is it or not a difference in principle?

Ans. I should say it was only a difference in degree, as I understand it.

And in answer to direct interrogatories resumed by J. E. Maynadier, esq., deponent saith as follows:

Int. 32. Please read your 20th cross-interrogatory and answer and explain your meaning.

Ans. I mean by it that the arm is connected to the rocker by the slot or socket. In my answer to the 20th cross-interrogatory, I mean that the bottom end of the arm is connected with the bed by journals. I misunderstood the 20th cross-interrogatory when I answered it, and on reading it now I do not understand it.

And in answer to cross-interrogatories resumed by Charles M. Keller, esq., deponent saith as follows, viz:

Cross-int. 47. In the means by which the rocker and the bed are connected in the Graham and Rouse re-issue, is there more than one axis of vibration?

Ans. I do not see more than one.

WANTON ROUSE.

108 *Deposition of Daniel Adams.*

Int. 1. State your name, age, residence, and occupation.

Ans. Daniel Adams; age, 53; residence, Waterbury, Conn.; occupation, mechanic.

Int. 2. Do you know Edmund H. Graham? If so, how long have you known him, and where did you first know him?

Ans. I do. I've known him since 1854, I think. I first knew him at Manchester, N. H.

Int. 3. Did you do anything, and, if so, what, for him in relation to his picker-staff motion? State fully all you did.

Ans. I made the patterns for it upon which he got his patent. After the patterns were made, I put them on to several looms, some in Man-

chester, some in Lawrence, and some in either Biddeford or Saco, I don't know which, as Biddeford is one side and Saco the other side of the river, and the mills are all one side of the river; but whether in Biddeford or Saco I don't know. I took the premium at the Mechanics' Fair, at that time, which was held on the opposite side of the river from where the mills are. I exhibited this picker-staff motion there, and took a premium for it.

Int. 4. Were there any other picker-staff motions exhibited at the fair? If so, please state how many, and give their names as near as you can recollect.

(Objected to.)

Ans. I think there was one other. I think it was the Stearns motion.

Int. 5. Did you ever return to Lawrence after you put the motions on the mill there? If so, how often after that, and after how long a time, and what did the manager of the mill say about the motions? Before answering, state the name of the mill.

109 Ans. It was the Pacific Corporation Mill. After I put the motions on the first time, I had a line from the superintendent giving me the size of the loom-shaft, and asking me to fetch some more Graham's motions to put on. I went twice after that—I think about six weeks or two months after I went down the first time—when I put on some more like those I put on the first time, and then I agreed to go down again.

When I went down the third time I found the superintendent had died a few days before; so I didn't put any on them, as the man who had taken his place wanted to see them run longer. He said he thought when he got established and settled down he would have them put on through the whole mill.

(What the superintendent said objected to.)

Int. 6. Were you ever employed at the Amoskeag Mills, in Manchester, N. H.; and, if so, when did you leave? And state whether Graham and Mr. W'm Stearns were employed there with you at any time.

Ans. I worked there. Left there, I think, in September, 1861, after working there six or seven years. Both of them were employed there with me. Stearns worked there all the time I was there. Graham came shortly after I came. I left them both there.

Int. 7. State what you know about Stearns' motion, and what you did, if anything, for him about his motion.

Ans. I made the patterns for Stearns' motion. Stearns worked some time on them. I had to alter them for him several times. Graham was studying on his motion at the same time, but Stearns wouldn't allow him to see those I was working on, fearing he might get some ideas for his own. I had to keep them out of sight when I was away, as Stearns was afraid Graham might see them. After I got through with Stearns' I commenced on Graham's.

Int. 8. Was Stearns' motion put in use in the Amoskeag Mills? If so, how were the first ones made? Refer, if you choose, to Exhibit J.

Ans. There was a few put in there like this, (Exhibit J).

Int. 9. State how these worked, and, if there was any difficulty, what it was.

110 Ans. The objection was the setting of the friction-roll, which was soon abandoned. They then adopted a solid iron heel. I think they put in an iron plug. That wore out so fast that they put in a chilled one, and then abandoned that and put in wood.

Int. 10. State more fully what was the difficulty about the friction-roller, about how long it would last, and how it would affect the motion of the rocker when it became worn.

Ans. The friction-roll, by its moving a little backwards and forwards, soon became worn and set so it would not turn, and it would wear into the "hawk-bill," or hook, and cause the rocker to tip from end to end instead of rocking on the bed. I couldn't tell exactly how long it would last, but I think about a month.

Int. 11. What was there in Stearns' first motions to prevent wabbling, and with what success was wabbling prevented in those motions?

Ans. There was nothing at the time to prevent its wabbling, but long afterwards he put up a guide in the middle of the rocker, attached to the bed, (like that in Exhibit 7.) The first motions did wabble.

Int. 12. You say long afterwards. Do you know how long?

Ans. I don't know how long. It was after they were fairly tried, and it was found they canted so much. By canted, I mean the rocker would swing on the bed.

Int. 13. Look at Exhibit No. 1, and state how that differs from the first patterns which you made for Graham.

Ans. I think that don't differ any from it.

Int. 14. How is it as to the shape of the journal-bearing arm?

Ans. As near as I can recollect, it is the same.

Int. 15. How does Exhibit No. 1 compare with the rocker motions put up by you in the Pacific Mills and in Saco or Biddeford?

Ans. I think they were all after the same pattern.

Int. 16. Look at the exhibit now shown you, and marked No. 10, N. A. P., ex'r, and state whether or not any of Graham's motions were made to your knowledge with arms like that.

Ans. Yes; I think there was.

111 Int. 17. How were the shuttles thrown in the Amoskeag Mills when you first went there?

Ans. They had some Perry motions in most of them. The shuttle was thrown by a picker-rod in the shuttle-box without a parallel motion.

Int. 18. What other kinds did they use, if any, before they used Stearns' and Graham's?

A. I think there wasn't any except the Perry and the old style. I won't be certain.

Int. 19. Do you know what business Graham was engaged in after he got this motion perfected? If so, please state.

Ans. He still remained at work on the Amoskeag, when I left.

Int. 20. State, if you know, what he did towards introducing those motions about that time.

Ans. He would at different times get leave of absence for a few days or a week and go off to introduce them.

Int. 21. Do you know who paid for getting Graham's patent, and why they paid?

Ans. E. A. Stearns, the agent of the Amoskeag, paid the expense of the patent for the use of them for that corporation.

And in answer to cross-interrogatories propounded by Charles M. Keller, esq., of counsel for respondent, deponent saith as follows:

Cross-int. 1. Were any of the Graham motions put on the Amoskeag Mills; and, if so, how many within your knowledge?

Ans. There was some put on; but I don't recollect how many. They have six mills of their own, and some were put on in three mills. They put on a few in each mill—perhaps half a dozen—to try them.

Cross-int. 2. Have you visited the Amoskeag Mills since you left in September, 1861; and, if so, at what times?

Ans. I have been there two or three times since—in 1862, and '63, and '64.

Cross-int. 3. Were the Graham motions in use there at those times?

112 Ans. I asked Graham how his motions run that he put in there, and he said they were going first-rate.

(Answer objected to as hearsay.)

Cross-int. 4. How many were put in at the Pacific Mills at Lawrence?

Ans. I think I put it on two looms each time that I went down.

Cross-int. 5. How many did you put on in the mills at Biddeford or Saco?

Ans. I think I only put on one pair, and left one or two pairs, which they put on afterward.

Cross-int. 6. When did you last see those in operation?

Ans. I haven't been there since I put them on. I heard from there afterward.

Cross-int. 7. In your answer to the third direct interrogatory, in speaking of the Graham motion, you state that you took the premium at the Mechanics' Fair; what interest did you have in that invention which led you to apply for a premium at that fair?

Ans. I had no personal interest, any more than that I was employed by Graham.

Cross-int. 8. Did you manufacture the motions for him at that time?

Ans. I made the patterns previous to that time. He manufactured them himself. I was only employed to put them on and introduce them.

Cross int. 9. In your answer to the fourth direct interrogatory you say that you think there was one motion in competition to Graham's at the fair; and you think it was the Stearns motion. Can you swear positively that it was the Stearns motion?

Ans. I could not swear positively, but I think it was, because that was the only motion that he was contending with.

Cross-int. 10. Who made the Stearns motions to which you have testified; and who put them on and introduced them?

Ans. He generally did it himself till he sold the right.

Cross-int. 11. As far as you know of your own knowledge, which of the two have been most in use, the Stearns or Graham motion?

113 Ans. Stearns' being out first, I think his had been most on at that time. Since that I can't tell which has been most used.

Cross-int. 12. Look at Exhibit 1, and state whether the Graham motions which you put in had the journal-bearing arm square and coming flush with the rocker, as in the exhibit.

Ans. I should think it was the same as that, as near as I can recollect.

Cross-int. 13. In the patterns which you made of the Graham motion to get the patent, was the journal-bearing arm square and put on as *as* in Exhibit 1?

Ans. I should think that the one he got his patent out on was like this, (Exhibit 1.)

Direct resumed.

Int. 22. Do you know anything of the use of the Graham motion in the Stark Mills, at Manchester? If so, please state.

Ans. Graham sold the right to the Stark corporation, and they put them on themselves.

Int. 23. State your opinion as to the relative merits of the Stearns and the Graham motions.

(Objected to, as calling for expert knowledge.)

Ans. I hardly know how to answer that. The Graham motion was considered the easiest-running motion, and less likely to get out of repair. This is my own opinion. It takes less power to carry it.

Cross resumed.

Cross-int. 14. Do you know how much the Stark Mills paid Graham for the right?

Ans. I don't know anything but what the parties said.

DANIEL ADAMS.

114

115

116 *Evidence for defendant.*

U. S. circuit court, district of Massachusetts.

E. H. GRAHAM AND W. ROUSE
vs.
WILLIAM MASON. } In equity.

Testimony taken on the part of the defendant under the 67th rule of the Supreme Court of the United States, in equity.

MARCH 25TH, 1868.

Present, J. E. Maynadier, esq., counsel for complainants, and Charles M. Keller, esq., counsel for defendant.

Defendant's counsel puts in evidence a certified copy of letters-patent granted to John L. Cheney for improvement in power-looms, bearing date the 17th day of March, 1857, marked Exhibit A.

Also a certified copy of letters-patents granted to Rensselaer Reynolds for improvement in power-looms, bearing date the first day of June, 1852, marked Exhibit B.

Also a certified copy of letters-patent granted to William Stearns for improvement in the picker motion of power-looms, bearing date the 5th day of July, 1859, marked Exhibit C.

Also a certified copy of letters-patent granted to Benjamin Lapham for improvement in the common power-loom, bearing date the 20th day of January, 1838, marked Exhibit D.

Also a certified copy of letters-patent granted to Daniel Bar-
117 num, for improvement in the power-loom, bearing date the 26th day of March, 1845, marked Exhibit E.

Also a certified copy of the model deposited in the Patent-Office by Daniel Barnum, on which the said patent, Exhibit E, was granted, which model is marked Exhibit F.

Also a shuttle-staff motion, marked Exhibit G, for looms, such as were made and sold by the defendant prior to the last re-issue of the letters-patent recited in the bill of complaint, and under which plaintiffs claim.

Also a shuttle-staff motion, marked Exhibit H, such as have been made and sold by defendant since the date of the re-issued patent under which complainants claim.

Also a shuttle-staff motion, marked Exhibit I, such as defendant has

made and sold before and since the date of re-issued patent under which complainants claim.

Also a shuttle-staff motion, marked Exhibit J, purporting to be made in accordance with the patent, Exhibit C.

Also a shuttle-staff motion, marked Exhibit K, purporting to be a representation of the shuttle-staff motion, described and represented in the patent, Exhibit B.

GEORGE DRAPER, sworn on the part of the defendant, doth depose and say, in answer to interrogatories propounded to him by Charles M. Keller, esq., counsel for defendant, as follows, namely:

Q. 1. What is your name, age, residence, and occupation?

A. George Draper; age, fifty years; I reside in Milford, Worcester County, Massachusetts; manufacturer.

Q. 2. What experience have you had in the construction and use of shuttle-motions for looms? State fully the extent of your knowledge and experience on that subject.

A. As long ago as 1832 I commenced work. I was an overseer and loom-fixer on various kinds of looms constantly until about the
118 year 1845. After that as superintendent in cotton-factories until 1852. Since 1852 I have been engaged in the business of introducing improvements in machinery in cotton and woolen mills, especially improvements on looms. About 1853 I commenced building, applying, and selling picker-staff motions for looms, and have continued in that business ever since.

Q. 3. Are you interested in any patents for picker-staff motions?

A. I am.

Q. 4. Are you acquainted with letters-patent granted to Edmund H. Graham for improvements in the parallel or rocker motion for picker-staffs on the 16th day of October, 1860, as re-issued to Graham and Rouse, plaintiffs in this suit, on the 28th of May, 1867? And, if yea, state whether you understand the invention therein described.

A. I am acquainted with it, and I think I understand the invention.

Q. 5. In the course of your visits to mills for the introduction of picker-staff motions, such as you are interested in, have you seen any picker-staff motions in use constructed in accordance with the description and drawings of the re-issued patent granted to Graham and Rouse, before referred to?

(Objected to.)

A. I have no recollection of seeing any in strict accordance with the drawings and specification.

Q. 6. You say in your last answer that you have no recollection of seeing any in strict accordance with the drawings and specification; state if you have seen any in general accordance with the specification and drawings, and in what respect they differed from the specification and drawings.

A. The Stearns motion, exhibit J, more nearly resembles that described in the specification and drawing than any I have seen in use, except it may be for trial, up to the time of the last re-issue to Graham and Rouse.

Q. 7. By whom were those made and sold?

119 A. They had been made and sold by E. D. and G. Draper, of which firm I am a member; and, also, by various manufacturers of looms.

Q. 8. Have you seen any shuttle-motions in use marked E. H. Graham, patented October 16, 1860?

A. I cannot swear positively that I have seen such motions in use, and I should not swear positively I had not. I have seen motions in use similar to Exhibit L; they were shown to me by W. Rouse, one of the complainants, in the Dean Cotton and Machine Company's factory, at Taunton, Massachusetts, of which Mr. Rouse was then superintendent. He, at that time, solicited me to take an interest in the sale of those motions under Graham's patent, and I refused to do so on the ground that they were public property, having seen the patent of Mr. Lapham's at the Patent-Office, which, in my judgment, contained a similar device.

Q. 9. Look at Exhibit G and state whether in your opinion it is like or different from the invention described and represented in the Graham and Rouse re-issue of the Graham patent before referred to, and give your reasons fully for the opinion you may express?

A. It is certainly not precisely like it, and I will state the difference in my opinion. This device, Exhibit G, has two separate journals connected by an arm; the device shown in the re-issued patent has not two journals in the sense that this Exhibit G has two journals—that is to say, two journals on different lines; theirs has not two journals on separate lines, but they are practically one journal, broken for convenience. It is manifest that the journals projecting from each side of the bar or arm, (*g g*,) exhibited in the drawing of the re-issued patent, might be formed of a single piece extending through the arm, allowing the arm to revolve on the journal, or the journal to revolve in the ears (*i i*) at will. The operation, if so changed, would be the same practically as now. This would reduce the two journals as shown in the re-issued patent practically to one.

120 Q. 10. To what parts of the picker-staff motion, Exhibit G, are the two journals attached?

A. One is attached to the bed and the other to the rocker.

Q. 11. By what means are the two journals in Exhibit G connected?

A. By means of an arm or link.

Q. 12. Is there any such connection between the rocker and bed described in the Graham and Rouse re-issued patent?

A. I don't find any such connection.

Q. 13. Look at the Lapham patent, Exhibit D, and state whether the picker-staff motion therein represented is like or different from Exhibit G.

A. I consider them substantially alike, except as to the matter of construction; the bearings in Exhibit G are longer than shown in the drawing of the Lapham patent, and the journals in Exhibit G are more nearly on a horizontal line, but the operation of the two would be substantially the same in my judgment.

Cross-examined by J. E. Maynadier, esq., counsel for complainants:

Cross-q. 1. If I understand you, you mean to testify that there is no substantial difference whatever between the mechanism described in the Lapham patent and Exhibit G. Am I right?

A. I mean that there is no substantial difference between the two. In looking at the matter again I see a provision made for a spring to be attached in Exhibit G for the purpose of taking the picker-staff back, which is different from the arrangement for that purpose shown in the Lapham patent.

Cross-q. 2. Do you consider the last difference you have mentioned a substantial one in the operation of the two mechanisms?

A. I do not consider it substantial. I think one might be as effective as the other.

121 Cross-Q. 3. Please examine the two again carefully and point any difference between them which, in your opinion, is substantial.

A. The re-examination shows nothing new to me as being substantial.

Cross-q. 4. Do you or do you not believe that there is any substantial difference between them whatever?

A. I do not believe there is any not already pointed out in my testimony.

Cross-q. 5. Do you mean to say that you have pointed out already any substantial difference?

A. I don't mean to say that I have pointed out any substantial difference except as to the spring, and, as heretofore stated, do not think that will make any substantial difference in the operation between the two.

Cross-q. 6. You have said that there is a substantial difference between Exhibit G and the mechanism described in the Graham patent, in this: one has two journals, and the other, practically, only one, the two journals in the first being on different lines, and in the latter on the same line. Do you see any other substantial difference than what you have mentioned?

A. I think that there is a substantial difference in the construction of the two in this respect: that the bearings in Exhibit G are on one side of the centre of the rocker, and in the other the bearings, which prevent the rocker being pulled forward by the action of the loom in throwing the shuttle, are on both sides. I do not see any other difference so substantial as to affect materially the operation of the motion.

Cross-q. 7. You have said that the journals being on one side in Exhibit G, and on both sides in the Graham patent, constitute a substantial difference between the two. State how this difference varies materially the operation of the motion.

A. If in Exhibit G the bearings were nicely fitted, and while new, I think the operation would be much the same as though the bearings were on both sides; but in case they were not nicely fitted, or
122 had become worn, the bearings on both sides would be more preferable, as tending to keep the rocker more surely in its proper position.

Cross-q. 8. Suppose the journals in Exhibit G were as short as the journals in the Graham, would this at all affect the operation; and, if so, how?

A. I think they would wear out sooner, and, consequently, the rocker would more likely get out of line.

Cross-q. 9. Look at the drawings of Exhibit D, and state what, in your opinion, is the length of the journals there shown, regarding the drawing of the loom as one-sixth of the full size?

A. I feel unable to determine from the drawing.

Cross-q. 10. Can you form an opinion as to whether the link in that drawing is thicker or thinner than the picker-staff at its upper end?

A. I should say it was thicker.

Cross-q. 11. State what substantial difference there is, if any, between the operation of the upper journal in Exhibit C and the journal in the Graham.

A. The journal in Exhibit G rises and falls and moves with that part of the rocker to which it is attached, and the journal in the Graham mechanism does not rise and fall.

Cross-q. 12. What material difference in the operation of the two mechanisms does this difference make, if any?

A. As these are detached parts of the mechanisms, depending upon other parts for their operation, I am unable to answer the question.

Cross-q. 13. What duty do these journals perform in the two mechanisms?

A. The journals and the parts connected therewith prevent the rocker being drawn forward on its bed, out of its proper position, by the action of the loom in throwing the shuttle, and at the same time allow the rocker to rock freely on its bed.

Cross-q. 14. Now please answer the 12th cross-interrogatory.

A. I must repeat my answer.

123 Cross-q. 15. What substantial difference does it make, if any, in the operation of these two mechanisms, whether the journals referred to move with the rocker or remain stationary on the bed?

A. In the mechanism of Graham the journal cannot rise, in consequence of the ears *i i* being slanted backwards, so that to raise up the journal would slide the rocker backward on its bed; but if the front side of the opening was perpendicular it might rise up with the rocker and work tolerably well. In Exhibit G, the journal being firmly attached to the rocker, must rise or fall with it.

Cross-Q. 16. What practical effect does this difference between the journals referred to have upon the operation of the two mechanisms?

A. I cannot describe or comprehend the practical effect caused by the difference in the effect produced by the difference in the journals detached from the different parts with which the journals are connected, which parts are different in the different mechanisms.

Redirect:

Q. 14. Has any claim been made against you by the plaintiffs, or either of them, charging you with the infringement of the Graham patent by reason of your making or vending shuttle-motions; and, if so, what shuttle-motion?

(Objected to, because it calls for the expression of the opinion of one or both of the complainants on a question of law, and generally.)

A. The firm to which I belong did receive a letter from Mr. E. H. Graham, making a claim in consequence of our having made and sold the Stearn' shuttle-motion.

(Answer objected to, because it purports to give the contents of a letter.)

(Signed) GEORGE DRAPER.

Subscribed and sworn to before me this 25th day of March, 1868.

W'M H. BISHOP,
Notary Public.

124 The further examination is adjourned to March 26th, 1868, at half-past 10 o'clock a. m.

MARCH 26TH, 1868—*half-past* 10 *o'clock a. m.*

Present, counsel for the respective parties.

HENRY B. RENWICK, sworn on the part of the defendant, doth depose and say, in answer to interrogatories propounded to him by Cha's M. Keller, esq., counsel for defendant, as follows, viz:

Q. 1. What is your name, age, residence, and profession?

A. Henry B. Renwick; age, about 50 years; New York City; civil and mechanical engineer.

Q. 2. State what have been your means of acquiring knowledge, theoretical and practical, of inventions and patents, and especially as to power-looms.

A. I was principal examiner in the United States Patent-Office for four years, and for the last sixteen years have been principally engaged in making examinations of patents, and have been frequently engaged in the examination of power-looms, and drawing patents for inventions connected with power-looms, and have also given testimony in suits in which power-looms have been in question.

Q. 3. Are you acquainted with the several patents put in evidence in this case, and severally marked Exhibits A, B, C, D, E, and the models severally marked F, G, H, I, J, and K?

A. I am.

Q. Are you acquainted with letters-patent granted to Edmund H. Graham for improvements in the parallel or rocker motion of picker-staffs, on the 16th day of October, 1860, as re-issued to Graham & Rouse, plaintiffs in this suit, on the 28th day of May, 1867? And, if yea, state whether you understand the same.

125 A. I have carefully examined the re-issue named in the question, and believe I understand the same.

Q. Look at the picker-staff motion marked Exhibit G, and state whether, in your opinion, it is substantially like, or substantially different from, any of the improvements described in the Graham and Rouse re-issued patent, and referred to in the claims thereof.

A. It is substantially different from all of the improvements described and specified in the Graham and Rouse re-issued patent. The Graham and Rouse re-issued patent describes and refers in all the claims thereof to two journals—one projecting on either side of the picker-staff. These journals, which are marked *h h* in the patent, are, in the operation of the machine, stationary with respect to the bed or platform on which the rocker vibrates, and movable with respect to the rocker itself; that is to say, a slot in the rocker while moving slides up and down over the shaft or trun'ion which connects these two journals; the purpose of the contrivance being to force the rocker to return to the same position on its bed at the end of each oscillation, and also to prevent the wabbling of the rocker, this latter function depending, first, upon the fact that the journals extend on both sides of the rocker, and are confined in suitable boxes; and, second, upon the fact that the two slots on each side of the casting of the rocker have one side of each of them (the sides furthest from the loom) pressed firmly by a spring against the trun'ions or shaft connecting the two projecting journals. In the preferred form described in the patent, and referred to in one of the claims, there is what is called a bar or arm attached to the journal; this bar is cylindrical, and performs one purpose only, namely, to give a greater extent of wearing surface, so that there shall be less abrasion and wearing of the parts, but, in performing this duty, it induces additional friction, as it prevents the trun'ions from turning as one side of the slot slides over them. My opinion is that the whole contrivance would be inoperative if either one

126 of the journals were removed, and, as I understand the description and specification, it is limited to two journals, projecting one on each side of the picker-staff, each of which is at the same time stationary with respect to the bed, and loose with respect to the rocker. In Exhibit G there is one journal projecting from one side of the rocker, not sliding in the rocker, but fastened immovably thereto. This journal is stationary with respect to the rocker, and movable with respect to the bed. This pin or journal carries one end of a link or radius bar, the other end of which is pivoted upon a pin, or it may be called a journal, made fast to the bed, the purpose of the link and the two pins being to force the rocker always to return to the same position at the end of each

oscillation, and also to prevent wabbling, the latter being dependant upon the length of the pins or journal and the length of the sleeve (making part of the link) which surrounds the pins or journal, and the fact that one pin or journal is immovably fastened to the bed, and the other is immovably secured to the rocker. As I find in this contrivance journals on one side only, and on neither of which the rocker slides, and nothing like, or performing the effect of, the bar *g g* of the patent, and no open boxes of any kind, and nothing specified in the Graham and Rouse re-issued patent except the rocker and the bed, which are common property, I am unable to discover any substantial identity between Exhibit G and the combination specified as of Graham's invention.

Q. 6. Compare the picker-staff motion, Exhibit G, with the patents, Exhibit B, granted to Reynolds, dated June 1st, 1852, and the patent, Exhibit D, granted to Lapham, dated January 20, 1838, and state in what respects it is like or different from the picker-staff motions described in said patents, or either of them.

A. Lapham's patent of the rocker, bed, and link, of which the model marked "Lapham M" (and by the examiner, Exhibit M) is a fair representation, and is, with the exception of perfection of workmanship and slight differences in proportion, in all respects identical with Exhibit G.

The journals or pins in both are the same, are immovably at-
127 tached in the same way—one to the rocker and the other to the bed—and are both connected by the same kind of link. In both machines the link insures the return of the rocker to the same position on the bed, and in both the link causes a slight sliding motion on the bed. In both, the link, journals, and sleeve prevent wabbling, this prevention being greater in degree in Exhibit G, owing to the greater length of the journals and sleeve. In the Lapham contrivance there is a wall or ledge attached to the bed on one side of the rocker, which would aid materially in preventing any wabbling. Reynolds, in his patent, of which Exhibit K is a fair representation of one of the methods described by him of holding the rocker in place, describes a rocker with two flanges attached to it, which embrace the bed and effectually prevent wabbling. This rocker is forced always to return to the same position on the bed by a leather strap attached at one end to the bed, and the other end to the rocker, and serving as a sort of flexible link. Owing to the flexibility and arrangement of the strap, this rocker of Reynolds does not slide on the bed, but rolls as a wheel on a road, and in this respect it differs in operation from Lapham's Exhibit M, Exhibit G, and Graham's invention. Reynolds also describes in his patent, as known prior to his invention, a rocker like Exhibit G in respect that it has two journals—one fast to the rocker and the other to the bed, connected by a link, and, also, another form of rocker in the above respects like G, but differing therefrom in the fact that it has two links and two sets of pins or journals; and as he describes the operation of these links and journals, this part of his description conveys to me no other idea than this, namely, that the journals of Exhibit G are to be duplicated on each side of the bed and rocker respectively, and that there is to be one link on each side of the rocker, such an arrangement of double links and two sets of journals having been common in many machines, in place of a single radius bar, prior to the date of either Reynolds' or Lapham's patent, and

so employed to force the moving journals to travel in the arc of a
128 circle without wabbling; and this construction of the contrivance, applied to a loom, would practically prevent wabbling.

Q. 7. Is the description in the said Reynolds patent, of the two picker-staff motions, therein stated to have been known prior to his invention, such that a skillful mechanic without invention could construct them?

A. I have no doubt that it is. One of them is a description of Lapham's, and the other is a description of substantially the same link and pins as Lapham's, duplicated, as I have before described, in a manner well known in other and prior machines other than looms.

Q. 8. Look at the picker-staff motion marked Exhibit H, and the one marked Exhibit I, and state whether they are substantialy like or substantially different from the improvements described in the Graham and Rouse re-issued patent, and referred to in the claims thereof; and in answering the said question refer, if you desire, to the several patents in evidence, marked Exhibits A, B, C, D, and E.

A. In both of the Exhibits H and I there is a rocker and bed, and a link to cause the rocker to return to the same position, and which operates incidentally to cause the rocker to slide slightly on its bed, as it does in Lapham's and two of the forms described in Exhibit B, (Reynolds' patent.) In I and H the link is made in the form of a chain-link, and surrounds the picker-staff socket and drops into a hook-shaped cavity cast in the bed. In H and I the bed has a V-shaped groove in it throughout its length, and the bottom of the rocker is V-shaped in its crop-section and fits therein. This construction is the counterpart of one of the forms described by Reynolds, who shows the groove on the rocker and the feather in the bed. This construction of the rocker and bed of Exhibits H and I is designed to prevent, and practically does prevent, the wabbling of the rocker, it being the efficient means in the whole contrivance for performing that purpose. In these Exhibits H and I the link differs in construction from the Lapham link and those described in Reynolds' patent. It differs in the fact that it has no sleeves to embrace journals, and no journals or pins made fast, the one to
129 the rocker and the other to the bed, and projecting on one or both sides thereof. Owing to this construction the bearing of the link is wholly within the width of the rocker, a bearing so short that the link, if effective at all, is of comparative little use to prevent wabbling. As I find in this contrivance no journals projecting on each side of the rocker stationary with respect to the bed, and with the rocker sliding over it as in the plaintiffs', no socket in the rocker in which the journals can slide, no arm or bar, (*g*,) or any equivalent thereof, and no journals projecting on each side of the rocker and on which it slides confined in open boxes, and no pin or bar (*g*) which is removable by reason of the journals fitting in the open boxes, I cannot find in either of these exhibits any of the combinations specified in the Graham and Rouse re-issued patent. The exhibits are, in fact, excepting differences in construction and not in principle, the same as Lapham's and the two forms described in Reynolds', as in all a link or radius bar controls the motion of a rocker; and the Exhibits H and I are the same in principle as the other form described by Reynolds, in that the wabbling is prevented by the rocker, and its bed being formed as a groove and its counterpart. In the Exhibits H and I, in Lapham, and in two forms of Reynolds, one point of the rocker moves in the arc of a circle described by the radius bar, whereas in Graham and Rouse no point of the rocker moves in such an arc, but on the contrary in an irregular curve compounded of the rolling motion of the rocker and the sliding motion of the slot therein upon the pin or loose journals.

Q. 9. In your opinion, is the picker-staff motion, described in the Graham and Rouse re-issued patent, substantially like or substantially dif-

ferent from the picker-staff motion described in the Stearns patent, dated July 5th, 1859, and marked Exhibit C?

A. It is substantially like that described in the Stearns patent in all respects except two: in the Stearns patent there is described a rocker and a bed identical in all respects with that in Exhibit C; also a projection from the rocker extending through the bed, and a spring
130 attached to the projection, identical in this respect with Exhibit C. In the Stearns patent there is described a roller mounted on journals extending on each side of the rocker and confined in boxes attached to the bed, and this roller and its journals in all respects is identical with the loose journals and the trun'ions connecting the same, of the Graham and Rouse re-issued patent. It is, also, like those journals and trun'ions, fast with respect to the bed and loose with respect to the rocker, and the rocker is borne against it by the force of the spring, just as one side of the slot is borne against the trun'ions of the journals in the Graham and Rouse re-issue. One side of the slot, moreover, slides over the trun'ions connecting the journals in the Graham and Rouse, re-issue, just in the same way as the shank of the hook attached to the rocker slides over the roller in Exhibit C.

A point in the rocker when moving, moreover, describes the same species of curve in both the re-issue and the Exhibit C.

The differences between the re-issue and the Exhibit C are, first, that an arm or bar, as it is called in the re-issue, is attached to the roller of Exhibit C, and also that the boxes which sustain the projecting journals are open in the re-issued patent and closed in the Exhibit C.

This attachment of the bar increases the friction, as it prevents the roller from rolling as the slot slides over it, but may prevent wear, owing to the increase of surface. I have here a model of the Graham and Rouse re-issued patent, marked Exhibit N, in which one side (the now acting side) of the slot can be removed, and in which there are two sets of journals, the one without the bar or arm attached to the journals, the other with the bar, as described, in the re-issued patent. By examining this Exhibit N, with the journals without the bar in place, and one side of the slot removed, it will be perceived that in that condition it is in all respects identical with the contrivance described in Exhibit C, controlling the rocker and preventing wabbling by the same contrivances combined in the same way, and identical in the mode of operation. I
131 call the pieces F F, represented in the drawings of the Stearns patent, journals, because they support the roller marked E in the said drawing, and because it is perfectly immaterial whether F F be in one piece extending through the roller, and with the roller turning thereon, or whether the roller and journals F F be in one piece, and the whole turn on the journals F in the round holes in the ears or cheeks projecting from the bed. And I call them journals for another reason, namely, that I should still call the journals of the Graham and Rouse re-issue journals if they were made in one piece and extended through a cylindrical hole in the bar or arm *g*. In this case they might stand still in the ears or cheeks and the bar would turn on them, but the office and operation of the bar and trun'ions would be exactly the same as though made in one piece.

Q. 10. Look at the model, Exhibit J, and state what it represents.

A. It represents the contrivance described in Stearns' patent, Exhibit C, and is in all respects substantially like it, differing immaterially in the precise curve of the sides of the cheeks, and in the fact that the cheeks are not quite so thick in the model as in the drawings, and do not approach so nearly to the sides of the picker-staff and shank of the

hook. In this latter respect the model is not so good practically as shown in the drawing of the patent, Exhibit C.

Q. 11. Look at Exhibit O, and compare it with Exhibits H and I, and state whether it differs from them, and in what respect, if any.

A. It does not differ from them substantially at all; it differs in degree merely in the length of the link and in the point at which the link is hooked upon the rocker; this difference causing the sliding motion of the rocker on its bed to be less in the Exhibit O than in any other rockers referred to by me in my answers, except one form referred to by Reynolds.

Q. 12. Look at the patent granted to Daniel Barnum on the
132 26th day of March, 1845, marked Exhibit E, and the certified copy of the model thereof, marked Exhibit F, and state in what respect the shuttle-picker motion therein described and represented resembles or differs from the Graham and Rouse re-issue.

A. They are alike, in the fact that both have rockers, both have beds, both have ears projecting from the bed on each side of the rocker, both have slots in the rocker. In both there is a pin passing through this slot, which is the journals and their connections in the Graham and Rouse re-issue, and which by passing through the slot controls the motion of the rocker. In Graham and Rouse the pin, which is the journal, can oscillate in the boxes, and the boxes are open. In Barnum's, as far as I understand it, the pin cannot oscillate in the ears, and there is no slit leading from the periphery of the ear to the hole in which the pin rests. In Graham and Rouse there is a bar attached to the pin, called in the re-issued patent journals, which bar, as before described, increases the surface and probably prevents wear. In Barnum there is no such bar. In both patents the curve described by a point in the rocker will be of substantially the same character.

Cross-examined by J. E. Maynadier, counsel for plaintiffs:

Cross-q. 1. Compare the mechanisms described in the Barnum and Stearns patents, and state what substantial difference there is between them.

A. If they be compared with respect to their mode of operation only, I see no substantial difference between them. In Barnum the pin on which the slot slides cannot revolve. In Stearns the pin becomes a roller and can revolve, thereby diminishing the friction. In Barnum there is no spring to hold the surface against the pin, so that it is necessary the slot should have two sides to it. In Stearns, as a spring is employed, only one side of the slot is essential. If I were comparing the two in a controversy in which the springs were in question, I
133 should say that there were substantial differences between the two contrivances.

Cross-q. 2. In each do you not find a pin, ears, (one on each side of the rocker,) and a slot in the rocker, all operating in substantially the same way and producing substantially the same result? My question is intended to include the substantial equivalents of either the three things mentioned.

A. Yes, with the exception, as before stated, that in Stearns, owing to the employment of a spring, there is but one slide to the slot.

Cross-q. 3. How does the pin and the friction-roller in Stearns' differ from the pin in Barnum's substantially?

A. In so far as they both control the rocker they are both the same in the combination; but if Stearns had a patent for the roller in the combination, as contrasted with Barnum's pin, it might be said with truth

that Stearns, by employing the roller, improved the combination, and could hold as infringers persons using it (the roller) even in view of the state of the art as described in Barnum's patent.

Cross-q. 4. You have said the parts F F are journals in Stearns' patent—suppose they were made square or were fast, as in Barnum's, would you still regard them as journals?

A. Do you, in your question, assume that the pin F F is to be made square throughout its length, so that the roller cannot turn, or that the pin is to be cylindrical in the middle, so that the roller can turn?

I assume that the "pieces F F," spoken of in your answer to direct interrogatory 9, are made square or fast; as to all the other parts of the pin, if there are any, I make no assumption whatever, but mean to confine my question to those parts of the pin, F F, in the patent which you have called journals. If you regard the whole pin as two journals, I assume the whole pin to be fast or square. If you regard only those parts of the pin outside of the friction-roller as journals, I confine my assumption to those parts.

134 A. I do not understand the ambiguity of the question to be removed. If the pin, F F, extends through the roller and be square throughout its length from the outside of one cheek to the outside of the other, and the hole in the roller be of the same form, and the roller could not turn at all, it would cease to be a roller and become a pin. If the pin was cylindrical from end to end, and the two ends pinned fast in the cheeks, then that function of the journals which consists in holding the roller in place and thereby preventing wabbling would still reside in the ends of the pin; but that function of the journals by reason of which the roller turns (thereby obviating friction) would be transferred to that part of the pin lying between the cheeks and on which the roller turns. As I have before stated in substance, the contrivance is substantially the same, whether the roller turns on the pin, or whether it turns with the pin in the boxes in the cheeks.

The further examination is adjourned to March 27th, 1868, at half-past ten o'clock a. m.

MARCH 27TH, 1868.

Present, counsel for the respective parties, and continued the examination of the witness, H. B. RENWICK, as follows:

Cross-q. 5. Look at Barnum's model, Exhibit F; imagine the ears to be removed from the bed, reversed, and secured to the rocker; that the bed is made thicker and a slot similar to the slot in the rocker made in it, and a pin passes through the ears and the slot in the bed, how would that mechanism differ substantially, if at all, from Barnum's? The ears upon the rocker I suppose to embrace the bed, just as they now embrace the rocker.

A. If both were considered broadly as mechanisms for causing the rocker always to return to the same place, and without reference
134*a* to their precise action on the rocker, they might be considered without substantial difference; but owing to the fact that the ears descend in the supposed construction, and hold the pin fast with respect to the ears so that it can slide in an immovable slot, there would be a great increase of friction, and the rocker would be kicked forward as it rolled, in addition to its rolling motion, whereas in Barnum's the rolling motion is retarded so as to cause the rocker to slip.

Cross-q. 6. By "kicked forward," do you mean anything more than that the rocker would slip forward in a direction opposite to its slip in

Barnum's mechanism? Would not the amount of slip be precisely the same, but in opposite directions?

A. I do mean a little more than that, because in Barnum's the wheel is merely retarded in rolling, which is commonly called slip, but in the supposed construction the wheel or rocker is forced forward in advance of its rolling motion. As far as I can see, the amount of slip would not be the same, but the sliding motion would be greatest in the supposed construction.

Cross-q. 7. In both Barnum's and the supposed construction, does not the rocker slide on its bed twice during two vibrations of the picker-staff; and in Barnum's, does not the rocker "slip," while the staff vibrates in one direction, and is it not "kicked forward" while the staff vibrates in the opposite direction?

A. It does in both. As far as I can see, the rocker in Barnum's does not act in the manner stated in the question, but, on the contrary, slips, or is retarded, while vibrating in both directions.

Cross-q. 8. Suppose all that part of the Stearns motion, described in Exhibit C, which projects from and below the rocker, were removed, reversed, and secured to the bed, as before secured to the rocker, that a slot was cut in the rocker to receive the parts so changed, and the pin and friction-roller attached to the rocker in a way similar to the way in which it is now attached to the bed, would this mechanism differ substantially from the Stearns mechanism?

134*b* A. I cannot understand the contrivance supposed in the question.

Cross-q. 9. Suppose the leather strap were removed before the changes stated in my last question were made, and answer the question.

A. I still do not understand the contrivance supposed in the question.

Cross-q. 10. In your opinion, can a skillful mechanic make a working rocker motion which will have what Stearns calls in his patent his hook G made fast to the bed and projecting upwards from the bed, instead of being made fast to the rocker and projecting downwards from the rocker; and also have the pin and friction-roller in a slot in the rocker, instead of in a slot in the bed?

A. I do not see how he can, if I understand the question, which I have some doubts about.

Cross-q. 11. Can you conceive of a rocker motion consisting of a rocker having a slot through it and having a friction-roller in the slot mounted on a pin which passes through the rocker, as Stearns' pin passes through his bed; of a bed which projects upwards a hook substantially like the hook G, in Stearns' patent, and which fits in the slot in the rocker and has its concave side against the friction-roller substantially as the short side of the hook G is against the friction-roller in Stearns', the friction-roller being held by a spring against the hook substantially as the hook in Stearns' is held against the friction-roller by the spring? By "hook" I mean the straight as well as the curved part of the piece marked G, and include the whole piece, the end of which is curved into a hook. Of course, I assume that the picker-staff be moved higher up if necessary. I also assume that the piece G be made about as wide in the direction of the length of the rocker as the piece and staff are in Stearns' patent.

A. If I understand your supposition, I think a rocker could be made in that way, and it would then be substantially the same as Barnum's,

with the difference that the pin would be fast in the rocker and
135 slide in slots in the ears, and would be converted into a roller instead of a non-revolving pin.

Cross-q. 12. Is the difference you have mentioned in your last answer a substantial or a formal difference?

A. I have already answered the question in cross-question 3.

Cross-q. 13. If I understand your answer to cross-interrogatory 4 you mean to assert that Stearns' mechanism is substantially the same whether the friction-roller revolve upon the pin as a journal, or whether it be fast upon the pin and revolve with the pin, the ends of the pin then becoming journals, or whether they both be incapable of revolution, thereby becoming the same as Barnum's pin; am I right?

A. No; you are not.

Cross-q. 14. Wherein am I wrong?

A. Because a fast pin will not perform all the operation of a friction-roller, and Stearns throughout describes the roller as a roller, that is, something that will turn.

Cross-q. 15. In your opinion would a mechanism precisely like Stearns' in every respect except that the piece upon the pin and the pin were both made fast so that they could not turn, be substantially different from the mechanism described in the Stearns patent?

A. What do you mean by the piece upon the pin?

Cross-q. 16. I mean the metal cylinder lying in the slot, through which the pin passes, and which is a friction-roller when it revolves, and a piece upon the pin when it don't.

A. If there were substituted in Stearns' patent a stationary pin for a friction-roller, which is, as I understand it, the supposition in the question, then the mechanism would be substantially like Stearns' in some respects, and different in the respect that there is no friction-roller, but a pin which, although it performs the guiding office, fails to perform the office of the roller in obviating friction.

Cross-q. 17. My question is, does this change make the mechanism substantially different from the Stearns mechanism, considered without regard to any patents whatever?

136 A. I think I have already answered that question in my answer before.

Cross-q. 18. Suppose a mechanism in every respect precisely like Barnum's, except that the pin was free to revolve, would that mechanism, in your opinion, be substantially like Barnum's?

A. I should think such a mechanism would be an infringement of Barnum's, if in force and valid; and in that view of the case it would be said that the roller, although doing more than the pin, was, for that purpose, substantially the same as the pin. But, if subsequent to Barnum's, a patent was granted for the combination of a friction-roller with the ears and slot of a rocker, such a patent might be valid, and Barnum's would be no answer to it on the ground that a pin was substantially the same as a roller.

Cross-q. 19. Suppose the boxes in the Graham mechanism were fast to the rocker instead of to the bed, and suppose the arm *g* was carried down into a slot in the bed instead of up into a slot in the rocker, would the two mechanisms be substantially the same or substantially different?

A. As far as I understand your supposition the supposed contrivance would not work at all, and therefore cannot answer your question.

Cross-q. 20. Why would it not work?

A. Because it would cut the arm off every time it vibrated.

Cross-q. 21.. I assume, of course, in my hypothesis, that no part of the arm (*g*) projects above the shaft. (I mean by shaft the piece which connects the two journals.) Now, please answer the question.

A. I still think the contrivance would not work, because it would still cut the pin in two every time it rocked.

Cross-q. 22. Why does not Graham's mechanism as shown in the patent cut the arm in two?

A. Because that part of the arm or bar which projects below the rocker vibrates in a slot so large that the pin never touches the ends of it in its vibrations.

137 Cross-q. 23. In your opinion, then, it is impossible to make a rocker motion like Graham's except that the boxes are fast to the rocker, and the arm which bears the journals projects downwards into a vertical slot in the bed corresponding to the slot in the rocker in which the arm now works?

A. That conclusion does not follow from what I have said; but I still see no way of making it as described in Graham's patent, except with what he calls loose journals, which are journals fast with respect to the bed, and on which a slot in the rocker slides, these journals being provided with a bar, one side of which at least is pressed upon by the slot in the rocker, thereby preventing abrasion.

Cross-q. 24. Now suppose Graham's rocker to be solid, that a pin passes through it in the place where the journals pass through it, that this pin is free to revolve, and that on each end of this pin a vertical arm is fastened, which arms pass down vertically, one on each side of the bed through ways on each side of the bed to receive them, would that mechanism be substantially different from Graham's?

A. It either would not move a single vibration, or if the arms passed through ways large enough for them to vibrate in, it would not control the rocker at all, and would be useless.

Cross-q. 25. I meant to assume in my last question that the ways in which the arms played were such as to prevent all motion of the arms, except up and down vertically; now please answer the question.

A. Then it would not work; moreover, it would not have a bar such as Graham describes, or any equivalent for it, nor would it have journals fast with respect to the bed and on which the rocker slides, as he describes, neither would it have open boxes.

Cross-q. 26. Does it make any substantial difference in the Stearns mechanism whether the friction-roller is fast to the pin and revolves with it, or whether the pin is fast and the friction-roller revolves on it?

138 A. I have several times before stated that it does not.

Cross-q. 27. Does it make any substantial difference whether the journals in Graham's mechanism be fast to the arm, (by journals I mean only the ends of the cross-piece which are contained in the boxes,) or whether they pass through a cylindrical hole in the arm so that the arm is free to revolve or oscillate?

A. I have already stated that it does not.

Cross-q. 28. You have said substantially that Barnum's mechanism was not substantially changed by allowing the pin to revolve, and that Stearns' mechanism was not substantially changed by making the pin and friction-roller fast, except in respect to the amount of friction; now state whether it makes a substantial difference or not, in your opinion, to make the journals in Graham's mechanism fast to their boxes, (I mean so that they can neither revolve nor move in any way,) and to make the arm fast (as it is shown in the patent) to the journals?

A. What I have said before will probably best appear from an inspection of the record. If Graham's contrivance be made with the arm or bar, and the bar fast to the journals immovably, and the journals immovably in their boxes, it will not work at all. If the bar be not used, and the journals be still fast in their boxes, and extend through the slot, it will work just as it does now.

Cross-q. 29. And, in this last hypothesis, will be substantially the same as Barnum's, will it not?

A. Yes.

Cross q. 30. Now if you put an arm on the friction-roller described in Stearns', extending up from that roller into a slot in the rocker, will not the mechanism be substantially the same as Graham's? I assume, of course, that the slot in Stearns' bed is lengthened sufficiently to allow the arm to play, and that the piece G is removed, and the space occupied by it is filled by the arm.

A. I am not exactly certain whether such a mechanism would operate or not. If it did, I think it would be, with respect to the combination of the arm and journals, the same as Graham's, except that under
139 such a construction the journals would not prevent wabbling, unless the arm was made square instead of round, as in Graham's patent, or there was a projection downwards from the rocker sufficiently far to bear against the journals.

Cross-q. 31. Now suppose that, from the ends of the journals in Graham's, arms extend upward into ways made in the sides of the rocker, and that the journal-bearing arm (*g*) be removed; that these ways hold these arms so that the rocker cannot move with respect to these arms, except up and down, between them; how does this mechanism differ from Graham's? I assume, of course, that these arms oscillate with the rocker, and are in every respect like the arm (*g*) except that they are in ways on the outside of the rocker, instead of in a slot in the rocker.

A. I am doubtful whether I understand the question; and I think that in Graham's patent there is no journal-bearing arm, on the contrary, an arm supported by the journals; if I understand your question aright, this arm is to be split in two and placed in two grooves outside of the rocker instead of in one socket in the centre of it. If the split pieces and grooves were so made that these two parts of the arm still made a long bearing for the rocker to slide upon, then the supposed machine would be substantially the same as Graham's.

Cross-q. 32. Now, suppose a mechanism made in every respect like Exhibit I, except that the upper journal was cast upon the rocker instead of being cast upon the link, and that its boxes were in the ends of the link instead of being on the rocker, would not the mechanism be substantially the same?

A. I think it would.

Cross-q. 33. Now suppose that the lower journal in Exhibit I was removed and the remainder of the link was allowed to hang from the rocker vertically, one of its sides on each side of the bed, and each side of the link was in ways in the sides of the bed, and held those ways so that they could not move except vertically up and down, would not
140 that be substantially the same as Exhibit I? I assume, of course, that the journal is so attached to the link and the rocker that both must move up and down in a vertical line as the rocker oscillates.

A. I have great doubts whether the supposed contrivance would work at all; if it did, it would not be substantially the same as Exhibit I. In Exhibit I the link acts precisely as a piece of string would if passed though the notch on the bed, then through the notch on the rocker, and

then had its ends tied together, and the strain on the link is a tension strain from one notch to the other, thus forcing the notch on the rocker to describe an arc of a circle of which the other notch is the centre; in the contrivance supposed the notch on the rocker would be forced to travel vertically in straight lines (and this is a motion which I never heard of in a rocker, and would, I believe, be impracticable,) and would be so forced to travel by the stiffness of the link or its tendency to resist a cross breaking strain, an action totally opposed to an action of a link, and which could not possibly be performed by a string.

Cross-q. 34. What parts connect the upper journal—I mean the journal directly upon the rocker—with the bed in Exhibits H and I?

A. The two sides of the link, the other end of the link and the notch in the bed which receives it.

Cross-q. 35. What other office do the parts you have mentioned perform?

A. If by connection you mean, as I suppose you do, the controlling of the rocker on its bed to bring it in the same position at the end of each vibration, they perform no other office.

Cross-q. 36. In Exhibits H and I do you find a journal or journals and a box both connected directly with the rocker?

A. I do, namely, one end of a link and a notch on the rocker in I, and the same end of the link and the part against which it bears in H.

Cross-q. 37. In both are not these journals and boxes connected indirectly with the bed?

141 A. I don't understand that there is any connection between these boxes and the bed. The journal or end of the link that lies in the notch is connected to the other end of the link which lies in a notch in the bed, and it may thus be said that there is an indirect connection between the rocker and the bed, and the notch on the rocker, which is a part of it, may be said to be connected to the bed by the direct connection of the link. The journal or link on the rocker is connected directly to the bed by the sides of the link and the other end thereof.

Cross-q. 38. In both are not the upper journals connected with the bed by means of the sides of the link and the lower journal?

A. Yes; including the notch in the bed.

Cross-q. 39. Are not the journals in both connected directly with the rocker, and indirectly, or by certain means (which is what I mean by indirectly) with the bed?

A. You may call either connection in H and I direct or indirect, as you please. The facts are palpable, as I have before described. One journal lies in a notch in the rocker, is a part of the link, and the other part of the link lies in the notch in the bed.

Cross-q. 40. Refer to your answer to the 26th cross-interrogatory, and state whether, in both, the upper journal sare not substantially "journals projecting each side of the picker-staff, and arranged beneath the picker-staff?"

A. If the end of the link resting in the rocker were projected on each side sufficiently far to make a practical bearing, and then the sides of the link were made thicker, and had holes drilled in them in which this journal projected, then you would have projecting journals on each side of the picker-staff, but in neither H nor I arranged beneath the picker-staff, but, on the contrary, on one side of the socket or casting which supports it.

Cross-q. 41. Does not the arm (*g*) in Graham's device connect the journals with the rocker?

A. I should say not. The slot in the rocker embraces the shaft con-

necting the journals, and the motions of the rocker would be con-
142 trolled in the same way by the journals and shaft if the arm (*g*) was removed. The slot slides over the arm and shaft when both are there, and on the shaft only when the arm is removed.

Cross-q. 42. Can the journals oscillate at all unless the arm (*g*) does?

A. If the arm (*g*) be attached to the journals, as described, it must vibrate as the journals oscillate in the boxes.

Cross-q. 43. In the mechanism, as described, can the journals oscillate at all when the rocker is stationary? I assume, of course, that the arm (*g*) fills the slot in the rocker.

A. No.

Cross-q. 44. In Exhibits H and I, if the upper journals were fast to the rocker, and at the same time fast to the sides or arms of the link, could the rocker make a single oscillation when the mechanism was put together?

A. If the journal was pinned fast so that it could not turn in the rocker then the rocker could not make the oscillations required in the machine.

Cross-q. 45. Do you find, in both H and I, bearings or boxes for the journals such that the journals may be laid in them in putting the motion together without liability to work out in the operation of the rocker?

A. You may call them journals and bearings or boxes if you please; I call them notches in which the ends of the link can be laid.

The further examination of this witness is adjourned to the 25th day of May, 1868, at 11 o'clock a. m.

MAY 25TH, 1868—11 *o'clock a. m.*

Met pursuant to above adjournment.

HENRY B. RENWICK recalled.

Redirect examination:

(It is agreed by counsel on both sides that Exhibit No. 3 (N.
143 A. P., examiner,) does not represent any picker-staff motion made by the defendant, but that it was made by Wanton Rouse, one of the complainants, and that Exhibit G (W'm H. Bishop, notary,) is a correct representation of the picker-staff motions made by the defendant prior to the re-issue of the plaintiff's patent.)

Q. 13. Look at Exhibit 9, (N. A. P., examiner,) and state whether it is a correct representation of what is described in the Reynolds patent, Exhibit B, in the following passage: "The rocker was connected with and kept on to its bed on the lay by one or two jointed links or metallic straps jointed at one end to the rocker and at the other to the bed, which necessarily caused the rocker at every vibration to slide on its bed."

A. In my opinion it is not.

Q. 14. Give your reasons why.

A. Owing to the links in this Exhibit 9 crossing each other, owing to the fact that each end of each link must move in the arc of a circle, and also to the fact that the pivots in the rocker are immovable with reference to each other, it is impossible for the contrivance to work except by the yield, spring, or lost motion of the parts, owing to bad mechanical construction. The model Exhibit 9 will permit the rocker to move a short distance owing to play and imperfect construction, but when it does so move one of the links is mere surplusage and performs no duty at all. By taking one of the screws out from that end of one of the links which is attached to the rocker, and moving the rocker through a distance necessary to throw a shuttle, the motion of the hole in the

rocker with reference to the hole in the link (from which the screw was removed) will demonstrate the fact that the apparatus cannot work practically without cutting the pin in two, or mounting the pin in a little carriage which will slide to and fro on the rocker. In this latter case the pin, its carriage, the link pivoted upon it, and the pin in the other end of the same link would be entirely useless, and might as well
144 never have been made. The model could also be made to work by making a slot in one of the links, but in that case that link and its appurtenances would have no effect in controlling the rocker, and be as useless as the former modification which I have described.

Q. 15. If told to connect a rocker with its bed by two links or straps jointed at one end to the rocker and at the other to the bed, how would you understand that language to mean; that the two links were to be jointed to one end of the rocker and their opposite ends to the bed, or one link to one end of the rocker and the other link to the opposite end of the rocker, and so as to the bed, as represented in Exhibit 9?

A. I would understand it to mean the first supposition named in the question.

Q. 16. Look at Exhibits, Sleeper Nos. 11 and 12, N. A. P., examiner, and state whether they represent the picker-staff motion described in that part of the Reynolds patent, Exhibit B, referred to in question 13, and give your reasons.

A. They do not, either of them. Because, in the first place, there are four links in each of them, if they can be called links, and no one of the four is attached at one end to the bed and at the other end to the rocker. Second, because these pieces have no effect at all in confining the rocker to any particular locality upon the bed, and the rocker is just as free to slide as if there were no links at all.

Q. 17. Look at Exhibit No. 8, (N. A. P., examiner,) and state whether, when in operation, the rocker was controlled by the slides at the side of the rocker and bed, and, if not, by what means it was controlled, and if controlled by the slides at the sides, what would be the effect on the operation?

A. There are marks of wear upon the sliding cheeks which work in the guides or slides attached to the bed, and also upon a pin which passes through a slot in the bed, and upon a cast-iron piece projecting down from the rocker to which the spring is attached. From careful examination of the parts, it is evident that the cheeks and slide
145 have been the chief controlling agency, the pin having taken control only through a small part of the rocking motion, when the picker is furthest from the loom, unless the apparatus has been at times worked without the slides, depending upon the pin alone. If controlled by the slides and cheeks alone, it would be necessary, I think, to cause the retracting spring to pull nearly vertically downwards, in order to prevent jamming of the cheeks in the slides, and the point in the rocker, to which the pivot on the cheeks is attached, would move nearly in a straight line vertically.

Q. 18. Do the sliding cheek-pieces, in Exhibit 8, operate in manner substantially like, or substantially different from, the link in defendant's Exhibit H?

A. Substantially different.

Q. 19. Look at Exhibit R, defendant's exhibit, whether with the metal on the leather strap, and state whether it resembles or differs from defendant's Exhibit H, either in construction or mode of operation.

A. It does not differ from defendant's Exhibit H in either respect.

Recross by J. E. Maynadier, esq.:

Cross-q. 46. What is a cycloidal curve?

A. It is a curve generated by any point of a circular disc when the disc rolls on a straight line.

Cross-q. 47. Suppose the bed in Exhibit 9 to have a plane surface, and that the surface of the rocker which bears against the bed is the arc of a circle, and that the rocker neither slips forward nor backward, will not the points near the ends of the rocker move in curves which are parts of the cycloidal curve? I mean without regard to the method of holding the rocker on the bed, and consider the rocker to be rocked back and forth without slip of any kind on the bed.

A. If there be no means whatever of holding the rocker on the bed, neither links nor pins, then the points in the rocker named in the
146 question would move in curves which are parts of a cycloid. They would also move in curves which are parts of a cycloid under an arrangement of restraining or holding mechanism like that exhibited in the drawings of Reynolds' patent, No. 8984, Exhibit B.

Cross-q. 48. Suppose the radius of the circle of which the rocker in Exhibit 9 is an arc be 30 inches, what proportion would that part of a cycloidal curve described by a point on one end of a rocker bear to the whole cycloidal curve? I take the rocker as described in my last question.

A. I don't know; and even though I could recall enough of my mathematics to answer the question, there is not enough data in the question to enable an answer to be made.

Cross-q. 49. Do you know about how long the complete cycloidal curve would be if described by a point on the circumference of a circle of 30 inches radius?

(This course of cross-examination is objected to, as the issue does not relate to geometrical problems, but to mechanical constructions and operations.)

A. That will depend upon the number of times you roll the circle over. I do not know what length or part of a cycloidal curve would be described by a single revolution of a circle.

Cross-q. 50. I mean a single revolution of a circle. Would not this curve be longer than the circumference of a circle?

A. Measuring along the curve, it would.

Cross-q. 51. In the circle of the diameter supposed, the cycloidal curve would be more than fifteen feet long, would it not?

A. That portion of the cycloidal curve described by a point in the circumference during one roll of the circle would be more than fifteen feet long.

Cross-q. 52. Now take an arc of a cycloidal curve about fifteen feet long, the arc being two inches in length, or $\frac{1}{90}$ of the whole cy-
147 cloidal curve, can you describe a circle an arc of which will practically (not mathematically) coincide with that arc of the cycloidal curve? I take that part of the cycloidal curve which is described by a point near one end of a rocker.

A. As every point in the cycloid is described by the same point I do not see that there is any limitation to any particular part of a cycloid in the question. It is impossible, mathematically (if my remembrance of these things be correct,) to make an arc of any circle coincide with any part of a cycloidal curve. Whether they appear to correspond or not would depend upon the sharpness of the pencil and the clumsiness of the draughtsman.

Cross-q. 53. Take Reynolds' rocker as an example, and suppose that the greatest curve described on any portion of that rocker is two inches in length, and $\frac{1}{90}$ part of the whole cycloidal curve, can you say whether or not it is possible to describe a circle an arc of which would coincide practically with that arc of the cycloidal curve? It is obvious that mathematically this could not be done, as it can be demonstrated that it would diverge infinitesimally. My question is, therefore, not as to the mathematics of the matter, but whether it can be done practically or not?

A. As I do not understand what you mean by practically, and as I have already stated that the difference between the two curves would depend upon the skill with which they may be drawn, and as I have no means of laying out the two curves, I cannot answer the question.

Cross-q. 54. Now suppose that a radius bar or "metallic strap" can be secured by a journal or pivot at one end to the bed, and in the same way at the other end to the end of the rocker, so that the axis on which the bar is pivoted to the rocker shall move in the arc of a circle which coincides with the cycloidal curve which would be described by a point on the rocker, and suppose a second bar was fixed in the same way between the other end of the rocker and the other end of the bed, can you explain how the natural motion of the rocker (regarded as the arc of a circle rocking on a plane surface) can be affected in any way whatever?

148 A. In the first place the supposition is a mathematical absurdity, because the arc of a cycloid cannot coincide with the arc of a circle. I suppose the supposition in the question to refer to a construction like Exhibit 9, and I have already demonstrated that that, if made with proper pivots, etc., would not rock practically at all. This being the case, I cannot answer the question.

Cross-q. 55. Can you tell whether a rocker could be secured to its bed by means of one metallic strap jointed or pivoted at one end to one end of the bed and at the other end to one end of the rocker, so that the curve described by the centre of the pivot upon the rocker would so nearly coincide with the cycloidal curve which that point in the rocker would naturally make that there would be no measurable or perceptible slip of the rocker upon the bed.

A. I cannot tell; but I think it would be impossible to do it.

Cross-q. 56. If it could be done, would it affect at all the curve described by a corresponding point at the other end of the rocker?

A. As before stated, I do not think it possible to do it, and cannot therefore make the supposition required before answering the question.

Cross-q. 57. How does the Exhibit No. 8 compare, in your opinion, with the mechanism described in the Graham and Rouse re-issued patent as regards substantial similarity in construction and mode of operation?

A. It is different in construction: the journal-bearing arm of Graham and Rouse sliding in ways attached to the rocker instead of in ways constructed in the bed, as in Exhibit 8, and the journal of Exhibit 8 moving up and down instead of being stationary in respect to the bed, as in Graham and Rouse's. In Exhibit 8 one point in the rocker moves in a vertical straight line, and in Graham & Rouse's no point moves in a vertical straight line, but in both there is a sliding piece confined by ways which resist the rolling tendency of the rocker and takes the wear incident to such resistance. Supposing the pin passing

149 through the slot in the bed to be taken away, I think the better opinion would be that Exhibit 8 is an equivalent of Graham and Rouse's, although it differs in one important particular in mode of oper-

ation. In Graham and Rouse's the slot in which the journal-bearing arm slids cehanges its inclination as the rocker oscillates, and has, consequently, no tendency to jam that arm in its guides. In Exhibit 8 the slots which correspond to the slot of Graham and Rouse's never change their angle of inclination, and have, consequently, a tendency to jam, as shown by the wear of the machine. Exhibit 8 is, in fact, Graham and Rouse's turned upside down, with the exception that Graham and Rouse depend upon the journal for prevention of wabbling, whereas in Exhibit 8 the wabbling is prevented by the concave V of the bed and the convex V of the rocker.

Cross-q. 58. Does this exception affect your opinion that Exhibit 8 is substantially the equivalent of the mechanism described in the Graham and Rouse re-issue?

A. It does not.

Cross-q. 59. Now, suppose the pin be not removed from the slot in the rocker of Exhibit No. 8, would that affect your opinion?

A. If the pin were left there, worn as it now is, and the cheek-pieces and guides were the really efficient contrivances, as they now are, in controlling the motions of the rocker, it would not affect my opinion.

HENRY B. RENWICK.

Subscribed and sworn to before me this 25th day of May, 1868.

[SEAL.] W'M H. BISHOP,
Notary Public.

150 UNITED STATES OF AMERICA,
Massachusetts District, ss:

I, John G. Stetson, clerk of the circuit court of the United States for the first circuit and district of Massachusetts, certify that the foregoing is a true copy of the record and of all proceedings in the cause of Edmund H. Graham et al., in eq., v. William Mason, in this court determined.

In testimony whereof, I have hereunto subscribed my name and affixed the seal of said court, at Boston, in said district, this twenty-third day of November, in the year of our Lord one thousand eight hundred and seventy-two, and of the Independence of the United States the ninety-seventh.

JOHN G. STETSON,
Clerk.

151 *Bond to party on appeal.*

Know all men by these presents, that we, William Mason, of Taunton, in the district of Massachusetts, manufacturer, as principal, and Charles L. Lovering and Charles R. Olney, both of said Taunton, are held and firmly bound unto Edmund H. Graham, of Manchester, in the State of New Hampshire, and Wanton Rouse, of Taunton, in the State of Massachusetts, in the full and just sum of six thousand dollars, to be paid to the said Graham and Rouse, their certain attorney, executors, administrators, or assigns; to which payment, well and truly to be made, we bind ourselves, our heirs, executors, and administrators, jointly and severally, by these presents, sealed with our seals, and dated the fifteenth day of January, in the year of our Lord one thousand eight hundred and seventy-two.

Whereas lately at a circuit court of the United States, holden at Boston, within and for the district of Massachusetts, in a suit in equity

depending in said court between said Graham and Rouse complainants, and said William Mason defendant, a decree was rendered against the said William Mason, and the said William Mason having obtained an appeal to remove the said cause to the Supreme Court of the United States to reverse the decree in the aforesaid suit, and a citation directed to the said Graham and Rouse citing and admonishing them to be and appear at the Supreme Court of the United States to be holden at Washington on the first Monday of December next:

Now the condition of the above obligation is such, that if the said shall prosecute his said appeal to effect, and answer all damages and costs if he fail to make his plea good, then the above obligation to be null and void; otherwise to remain in full force and virtue.

W'M MASON. [L. S.]
CHARES L. LOVERING. [L. S.]
CHARLES R. OLNEY. [L. S.]

Signed, sealed, and delivered in presence of—
W'M H. BENT.
Approved:

Associate Jus. Sup. Court of the U. S.

J. E. MAYNAIDER,
Solic'r for Compl't.

A true copy of the bond taken by the judge at the time of allowing the appeal named in said bond, which bond is on file in the office of the clerk of the circuit court of the United States for the first circuit and district of Massachusetts.

Attest:

JOHN G. STETSON,
Clerk U. S. C. C., Mass. Dist.

(Indorsement on cover:) No. 377. William Mason, appellant, vs. Edmund H. Graham & Wanton Rouse. Massachusetts. C. C. U. S. Filed 20th December, 1872.

ADDITION TO RECORD.

SUPREME COURT OF THE UNITED STATES.

No. 97.

WILLIAM MASON, APPELLANT,

vs.

E. H. GRAHAM AND AL.

FILED NOVEMBER 3, 1874.

1 *Exhibit Rouse and Graham, N. A. P.*

This agreement made this twenty-sixth day of February, in the year of our Lord eighteen hundred and sixty-one, by and between Edmund H. Graham, of Manchester, in the county of Hillsborough, and State of New Hampshire, of the first part, and Wanton Rouse, of Taunton, in the county of Bristol, and State of Massachusetts, of the second part, witnesseth:

That whereas Edmund H. Graham, the said party of the first part, did invent a new and useful improvement in picker-staff motion, for which improvement letters-patent of the United States were granted to the said party of the first part, bearing date the sixteenth day of October, 1860, and numbered 30,441; and whereas Wanton Rouse, the said party of the second part, is desirous of acquiring one undivided half part of all the said party's (of the first part) right, title, and interest in
2 and to the said invention and letters-patent, and has contracted with the said party of the first part for the purchase of the same; Now, therefore, this indenture witnesseth that in pursuance of the said contract, and for and in consideration of the sum of one dollar to the said party of the first part in hand paid by the said party of the second part, the receipt whereof is hereby acknowledged, and in further consideration of the stipulations and agreements hereinafter recited to be kept and performed by the said parties of the first & second parts, the said party of the first part has hereby assigned, sold, set over, and conveyed, and by these presents does assign, sell, set over, and convey unto the said party of the second part, one undivided half part of all the said party's (of the first part) right, title, interest, and property in and to the said invention and letters-patent, a license to manufacture and use the afore-
said improvements having been granted to the Amoskeag Manu-
3 facturing Company, a corporation established by the laws of the commonwealth of New Hampshire, and located in Manchester aforesaid, the same to be held and enjoyed by the said party of the second part for his own use and behoof, and for the use and behoof of the said party's (of the second part) legal representatives, as fully and entirely as the same would have been held and enjoyed by the said party of the first part, had this assignment and sale not been made. In consideration of the assignment and conveyance by the said party of the first part to the said party of the second part of one undivided half part of all the said party's (of the first part) property, right, title, and interest in and to the aforesaid new invention and letters-patent, and in further consideration of the sum of one dollar to the said party of the
second part in hand paid by the said party of the first part, the
4 receipt whereof is hereby acknowledged, and in still further consideration of the stipulations and agreements hereinafter recited to be kept and performed by the said parties of the first & second parts, the said party of the second part has assigned, sold, set over, and conveyed, and by these presents does assign, sell, set over, and convey, unto the said party of the first part, one undivided half part of all the said party's (of the second part) right, title, & interest in and to certain new & useful improvements in "pickerstaff motion" invented by said Rouse, a drawing and description of which is hereto affixed, the same to be held and enjoyed by the said party of the first part for his own use and behoof, and for the use and behoof of his legal representatives, as fully and entirely as the same would have been held and enjoyed by the said party of the second part, had his assignment and sale not been made. The said party of the second part hereby also further

5 binds himself and agrees with the said party of the first part that in case an application for letters-patent should be deemed advisable and found necessary to be made for the improvements in picker-staff motion invented by the said party of the second part, to execute an assignment to the said party of the first part of one undivided half part of all the property in the said new invention and letters-patent, if any are issued therefor, as herein above stated, and it is hereby further understood and agreed by the said partys of the first and second parts, and forming a part of the considerations for the counter-assignments herein made, that any and all expenses contracted by either of the two contracting parties or by both in conjunction, in manufacturing, introducing, selling, licensing, &c., of the aforesaid new improvement in "picker-staff motions" shall be deducted from the proceeds accruing from the sales of the loom-pickers, manufactured
6 according to the improvements invented by either of the said parties, or from licenses granted to other parties to manufacture and use the same, and that neither of the said parties of the first & second parts shall be held liable for his portion of the expenses contracted by the other party, unless the net profits of the sales, licenses, &c., shall exceed the whole of such expenses; and the said party of the first part also binds himself by this agreement to grant licenses to the Dean Cotton-Machine Company and Eagle Cotton Company, two corporations duly established by the laws of the Commonwealth of Massachusetts, & located in Taunton aforesaid, of the right to manufacture and use the aforesaid improvements invented by the said party of the first part in all the mills and factories belonging to the said two corporations in Taunton, and in no other place or places whatever. The fol-
7 lowing is the description referred to in the foregoing agreement, and forming a part of the agreement between the said parties of the first and second parts: *a* is a curved rocker-shaft; B, a socket in which is placed the pickerstaff; C, a horizontal bed-piece for the play of the rocker *a*; D, a socket for the shaft of the loom; E, a shaft attached to the rocker-shaft *a*, and having a bearing in the journal *f*, which journal is connected by a rod, *g*, to another hollow shaft, *h*, which bears and moves upon a rod or shaft, *i*, the two serving to give parallel motion to the movement of the rocker-shaft *a* with its picker-staff. *j* is a spiral spring attached to the rocker-shaft *d* and socket D for the purpose of retracting the shaft *a*,

Fig. 1.

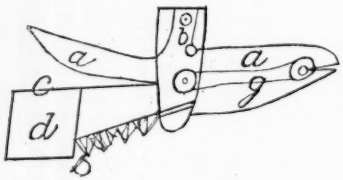
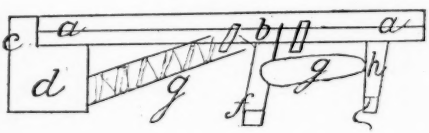


Fig. 2.



the accompanying figures 1 and 2 being respectively side & top
8 views of the improvements of the said party of the second part. The main objects and principles of the above invention are substantially similar to those invented and patented by the aforesaid Edmund H. Graham.

In testimony whereof the said parties of the first & second parts have

hereunto interchangeably set their hands & seals the day and year above written.

W. ROUSE.
EDM. H. GRAHAM.

Witnesses:
C. W. STANLEY, to signature of E. H. G.
F. B. DEAN, to signature of W. R.

STATE OF MASSACHUSETTS,
County of Suffolk, ss:

Then personally appeared before me the above parties of the first and second parts, and acknowledged the foregoing agreement by them signed and sealed to be their free act and deed.

JOSEPH GAVETT,
Justice of the Peace.

9 DEFENDANT'S EXHIBIT A.

The U. S. Patent-Office to all persons to whom these presents shall come, greeting:

This is to certify that the annexed is a true copy from the records of this office of the letters-patent granted John L. Cheney, dated March 17th, 1857, No. 16824, for "Imp't in power-looms."

In witness whereof I, J. M. Thacher, Acting Commissioner of Patents, have caused the seal of the Patent-Office to be hereunto affixed this tenth day of August, in the year of our Lord one thousand eight hundred & seventy-four, and of the Independence of the United States the ninety-ninth.

[SEAL.]

J. M. THACHER,
Acting Commissioner.

10 No. 16824.

The United States of America to all to whom these letters-patent shall come:

Whereas John L. Cheney, of Lowell, Massachusetts, has alleged that he has invented a new and useful improvement in power-looms, which he states has not been known or used before his application; has made oath that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or discoverer of the said improvement, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the Treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose.

These are therefore to grant, according to law, to the said John
11 L. Cheney, his heirs, administrators, or assigns, for the term of fourteen years from the seventeenth day of March, one thousand eight hundred and fifty-seven, the full and exclusive right and liberty of making, constructing, using and vending to others to be used, the the said improvement, a description whereof is given in the words of the said Cheney in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof I have caused these letters to be made patent, and the seal of the Patent-Office has been hereunto affixed.

Given under my hand at the city of Washington, this seventeenth day of March, in the year of our Lord one thousand eight hundred & fifty-seven, and of the Independence of the United States of America the eighty-first.

[L. S.] JACOB THOMPSON,
Sec'y of the Interior.

Countersigned and sealed with the seal of the Patent-Office.
C. MASON,
Commissioner of Patents.

12 The schedule referred to in these letters-patent, and making part of the same.

To all persons to whom these presents shall come:

Be it known that I, John L. Cheney, of Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful improvements in power-looms; and I do hereby declare that the same is fully described and represented in the following specification and the accompanying drawings, of which—

Figure 1 denotes a front elevation of a loom with my improvements attached.

Figure 2 is an end elevation of the same.

Figure 3 is a sectional view of the parts which constitute my improvements & other parts adjacent. Similar letters of reference in each of the figures indicate like parts.

13 A represents the frame of a loom; B is the driving or crank-shaft, which, at each revolution, operates the lathe C forth and back; the lathe swinging on the rocker-shaft R, and in all respects made like many in common use. The gear D at the end of shaft B drives the gear E, which is fastened to the end of the cam-shaft F; as the gear D is only one-half as large as E, it must revolve twice to give one revolution of gear E.

G G^1 are two cams placed on the shaft F, for the purpose of giving motion to the levers H H^1. The levers H H^1 are connected with the picker-staves I I^1 by means of the straps J J, passing under the rollers K K.

The foregoing parts are common to every loom, and do not form the subject of my improvements, but are introduced to show clearly the connection and relation of my improvements to the rest of the

14 loom. As there are two picker-staves to every loom, and both exactly alike, I will, for simplicity, confine the description of my improvements to one of them, that one which is connected with the picker-staff I. L is a toothed segment or rocker, provided with a suitable place to receive the lower end of the picker-staff I, and into which the staff is firmly secured. The teeth M M^1 are not so wide as the face of the rocker, but a plane surface is left each side of them, which is intended to rest upon the raised edges of the stand N, which supports the rocker. Holes are cut in the stand N to receive the teeth of the rocker, which may be more distinctly seen in the section in Figure 3. The raised edges on the upper surface of the stand N, upon which the lower end of the picker-staff rocks, are perfectly

15 straight, but not horizontal; they are made to incline from the loom downwards, just sufficient so as to cause the rocker L and picker-staff I, after they have been jerked forward by the action of the cam

G, lever H, strap J, for the purpose of throwing the shuttle, to fall back to the lower end of the stand, and thus cause the upper end of the picker-staff to move to the rear end of the shuttle-box, to be in readiness to throw the shuttle forward again. This simple and effectual arrangement I have made to take the place of a spring or other force, which is used for the same purpose in other looms. The stand N, which supports the picker-staff, is fastened to the end of the rocker-shaft R, and of course both stand and staff have a motion in unison with the lathe.

Connecting and moving with the stand N is another, O, which
16 is provided on its upper end with a guide, Q, of *of* the peculiar shape as shown in the drawings. P is a small stud or roll on a stud*d*, which is fastened into the picker-staff and is intended to play against the guide Q, which is on the top of it, and the surface of which is made to conform to the wa'ved line which the roll describes in the forward and back movement of the picker-staff I. The guide Q, acting upon roll P, is intended to hold the picker-staff I down upon the stand N, but at the same time leave it free and unrestrained in its forward and back movement. From the description of the various parts and movements above given, it will be seen that the picker-staff I, in its forward and back movement, does not swing on any one center or point, but, by means of the rocker L, rolling on the inclined stand N, is
17 continually changing the center upon which it swings; and consequent upon this and upon the right curve given to the rocker L, the proper inclination of the stand N, and the proper adjustment of of the staff I upon the rocker, depends the line described by the point in the picker-staff which strikes the shuttle. The parts may be arranged so as to make this line perfectly horizontal, and thus produce what is called a "parallel motion," but as I prefer it and show it in my drawings, the line described should be such as would have the effect to slightly raise that end of the shuttle against which the picker-staff strikes, and continue a regular and very gentle rise of it until the shuttle leaves the shuttle-box. In this way the head of the shuttle is pointed downward, and is consequently less liable to shoot out through the warp and produce injury.

18 I would remark that I only employ the guide Q and roller P, or its equivalent, with reference to a rocker L, geared to its stand N, the object of such guide and roller being to prevent the two from becoming ungeared during the throw of the pick-staff, and particularly at the termination of such, when the momentum is so great as to cause the staff to rise upward. No spring applied to the rocker to keep it on its stand will effect the purpose, as practice has fully demonstrated. I am aware that such has been attempted, in the manner shown in Rensselaer Reynolds' application for a patent; but in this case the spring does not operate with a guard-stand and therefore is no equivalent to the guide Q and roller P. When a spring is used, its elasticity, which must necessarily be confined to such a limit as will not prevent the throw
19 of the picker staff, will not prevent the ungearing of the rocker or an injurious upward lift of the picker. Nothing but an unyie'ding guide, such as the guide Q, will be sufficient. Such will operate and require little or no oil to lubricate it.

I do not claim supporting the picker-staff by a rocker and horizontal rail or stand; nor do I claim applying to the picker-staff and its supporting bracket*t* a curved slotted guide and a roller, as the same is shown in Albert C. Williams' application for a patent. Nor do I claim applying to the picker-staff a spring, for the purpose of retracting such staff. Nor do I claim applying to the rocker and its stand a spring to bring

the rocker back to its place after having picked, and also to secure it to the rail while in the act of of picking. Nor do I claim making the striking-point of the picker-staff to travel in a straight horizontal line.

What I do claim is my improved picker motion or mechanism,
20 as made with a guard-stand and rocker; a stationary guide Q, and a stud or roller, P, and with reference to the picker-staff I, substantially as described.

I also claim so arranging the top bearing surface of the stand of the rocker that it may incline downward as specified, and so as to obtain all the advantages of a spring without the actual application or use of the same, meaning to claim such an arrangement of the top surface with respect to the rocker-staff as an improved equivalent to the spring.

In testimony whereof I have hereunto set my signature.

JOHN L. CHENEY.

Witnesses:
BENJAMIN PATCH.
CHARLES A. WELCH.

Exd. J. A. R.

(Here follows diagram marked page 20.)

21 GRAHAM & ROUSE }
vs.
WM. MASON. }

DEFENDANTS' EXHIBIT B.—WM. H. BISHOP, *Notary Public.*

The U. States Patent-Office to all persons to whom these presents shall come, greeting:

This is to certify that the annexed is a true copy from the records of this office of the letters-patent granted Rensselaer Reynolds, dated 1st of June, 1852, No. 8984.

In testimony whereof, I, T. C. Theaker, Commissioner of Patents, have caused the seal of the Patent-Office to be hereunto affixed, this
[SEAL.] twenty-second day of October, in the year of our Lord one thousand eight hundred and sixty-seven, and of the Independence of the United States the ninety-second.

(Signed) T. C. THEAKER.

22 EXHIBIT "B²."

No. 8984.

The United States of America to all to whom these letters-patent shall come:

Whereas Rensselaer Reynolds, of Valatia Village, N. Y., has alleged that he has invented a new and useful improvements in power-looms, which he states has not been known or used before his application; has made oath that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or discoverer of the said improvements; and that the same have not, to the best of his knowledge and belief, been previously known or used; has paid into the Treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property

in the said improvements, and praying that a patent may be granted for that purpose: These are therefore to grant, according to law, to the said Rensselaer Reynolds, his heirs, administrators, or assigns, for the term of
fourteen years from the first day of June, one thousand eight hun-
23 dred and fifty-two, the full and exclusive right and liberty of
making, constructing, using, and vending to others to be used, the said improvements; a description whereof is given in the words of the said Reynolds in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof I have caused these letters to be made patent, and the seal of the Patent-Office has been hereunto affixed.

Given under my hand, at the city of Washington, this first day of June, in the year of our Lord one thousand eight hundred and fifty-two, and of the Independence of the United States of America the seventy-sixth.

ALEX'R H. H. STUART,
Secretary of the Interior.

Countersigned and sealed with the seal of the Patent-Office.

THOS. EWBANK,
Commissioner of Patents.

24 The schedule referred to in these letters-patent, and making part of the same.

To all to whom these presents shall come:

Be it known that I, Rennsalaer Reynolds, of Valatia Village, town of Kinderhook, and State of New York, have invented certain new and useful improvements in power-looms, and that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings making part of this specifiention, in which—

Figure 1 is a front elevation.
Figure 2 a right-hand elevation.
Figure 3 a plan.
Figure 4 a vertical section, taken at the line *x x* of Figure 1.
Figure 5 a section of the lay, taken at the line *y y* of Figure 3.
Figure 6 a section of the picker.
Figure 7 a separate perspective view, full-size, of the temple, and
Figure 8 a longitudinal vertical section thereof.
The same letters indicate like parts in all the figures.

Since the first successful application of the power-loom to the
25 art of weaving, nearly all, and by far the most important improvements which have been made in the loom for weaving plain fabrics are to be found in apparently slight modifications of the mechanism, with the view to increase the speed without giving such serious shocks, either to the mechanism or the threads to be woven as would break them. Rapidity of weaving, quality of products, cheapness of original construction, and durability, are the essential objects to be attained in the great rivalry of weaving. Every modification, therefore, that either increases the rapidity of weaving, reduces the original cost, or increases the durability, or improves the quality of the fabric produced, becomes of national importance.

To the best of my knowledge the highest practical speed heretofore attained is 140 picks per minute, but by my improvements I have been able to attain, with entire success, about 200 picks per minute, while at the same time I have reduced the cost of construction without increasing the liability to break.

The first part of my invention relates to the picker-staff motion.
26 The upper ends of the picker-staffs in my improved loom constitute the pickers for driving the shuttle, and as for this purpose that face of the picker which strikes the shuttle must, during its vibration, traverse along a line parallel with the surface of the race-board. The lower end of the staffs to this end are formed with rockers, the curves of which are segments of circles struck from the points of contact with the point of the shuttle. This has heretofore been done, and I do not therefore claim it as my invention, but the mode of application heretofore adopted is defective. The rocker was connected with and kept onto its bed in the lay by one or two jointed links, or metallic straps, jointed at one end to the rocker and at the other to the bed, which necessarily caused the rocker at every vibration to slide on its bed. Besides, this mode of connection would not admit of the rapid motions which I desire to and have attained.

The nature of this part of my invention consists in connecting the rocker of the picker-staff with the bed on which it rocks, by means of a strap interposed between the two, and attached at one end *of* the outer end of the rocker, and at the other to the inner end of the bed,
27 so that the tension of the spring which draws back the picker-staff and the resistance of the shuttle always keep this interposed strap tight, whilst the rocker is held down to the bed by the tension of the connecting-strap and the strap from the treddle by which it is operated. By this means the parts are rendered durable, avoid friction, and admit of much greater rapidity of motion than ever before attained.

The second part of my invention relates to the method of arresting the shuttle when boxing. At the time the shuttle enters the box it should meet with a gradual resistance to arrest its momentum to avoid the shock and its consequences, which otherwise would be produced by striking against the picker.

This has heretofore been done by means of a spring-lever in front of each shuttle-box, called the binder. It is important that there should be as little resistance as possible to the motion of the shuttle at the time of starting.

With the view to effect this last object looms have heretofore been constructed with a lever projecting from what is called the protector or rod, which is connected with the shuttle-binders, and at the time
28 the shuttle is thrown this lever is struck by a pin on one of the connecting rods, by which motion is communicated from the cranks to the lay, thus elevating this lever so as to remove the pressure of the springs from the binders at the time the shuttle is thrown. This mode, however, is defective for the reasons that the binders always present the same resistance to the shuttle from the time it begins until it has completely entered the shuttle-box, and because it will not admit of very rapid motions on account of the shocks produced by the striking of the pin against the lever.

These defects I have avoided by leaving the shuttle free from the binders at all times except when entering the box, and gradually increasing the pressure of the binders as the shuttle moves in the box until it is entirely arrested. And to this end the second part of my invention consists in forcing the binders inwards against the shuttle, whilst entering the box, by means of an arm on a rocker provided with a spring which is acted upon by a pin on one of the connecting-rods, extending from one of the cranks to the lay. In this way I avoid the
29 severe shocks heretofore experienced; the spring gradually yielding to the action of the pin, and the pressure on the binders being

radually increased to gradually arrest the shuttle by the increasing nsion given to the spring by the motion of the pin. I have found, by peated experiments, that at the high velocities which I have attained on my improved loom, that metal springs under the rapid vibrations induced by percussion to which they are exposed, break so often as to render the expense of renewing them, together with the loss of time, a matter of serious consideration. To remedy this, I instituted a series of experiments, and finally discovered that springs made of wood will resist the most rapid vibrations induced by percussion for a long time without being seriously injured.

The fourth part of my invention relates to the mode of securing the raw-hide to the picker-staffs. The force and rapidity given to the points of the shuttle by the pickers, cause small pieces of the raw-hide to break off, which frequently lodge on and are woven into the cloth, thus
30 injuring the surface of the fabric, and when intended for prints, seriously injuring it by indenting the surface of the rollers, and besides the upper end of the picker-staffs being necessarily small, it becomes a serious matter to devise a practical mode of securing the raw-hide to the wooden staffs.

The nature of this part of my invention consists in letting in and fitting the raw-hide to the face of the picker-staff and securing it thereto by a leather strap or its equivalent, which envelopes the two, thus firmly securing the two together and at the same time preventing pieces from breaking and flying off.

In the accompanying drawings *a* represents the frame of the loom, and *b* the driving-shaft which communicates motion to the crank or lay shaft *c*, by cog-wheels *d d*. On the end of the driving-shaft there is a loose pulley, *e*, which receives the belt from some first mover. On the hub of this pulley there is a collar, *f*, (which turns freely between shoulders,) provided with a pin that passes through a hole in a lever *g*, that turns on a fulcrum-pin *h*, the end of the said lever being passed through a mortise in the spring shipper *i*, so that by the motion of the
31 shipper the loose pulley is made to slide on its shaft.

By the side of the loose pulley there is an arm or wheel, *j*, fixed to the shaft, and provided with a clutch-spur corresponding with a like spur, *k*, on the loose pulley, so that when the pulley is pushed in by the shipper the pulley and wheel shall be clutched to communicate motion to the shaft, and when pushed out by liberating the shipper, that the pulley shall run free. The great advantage of this arrangement over the usual mode of driving looms by means of the fast and loose pulley, is that the loose pulley is instantaneously connected or disconnected from the clutch-wheel, whilst in the old mode, a considerable length of time is required to complete the connection, on account of the width of the belt, thereby also occasioning a loss of power.

On the end of the lay-shaft there is a fly-wheel, *l*, against the periphery of which a brake, *m*, makes friction when the loom is thrown out of gear. This brake is hung on a stud-pin *n*, and its upper end is connected by a rod, *o*, with a shipping-lever, *p*, turning on a fulcrum-pin under the breast-beam, the inner end of the said lever being con-
32 nected with the protector-stop *q*. The race-beam of the lay is provided with a protector, *r*, of the usual construction, but the tension of its spring *s* is just sufficient to hold up the protector *r*, but not to force its arms *t t* so hard against the shuttle-binders *u u* as to bind against the shuttle in the shuttle-boxes.

From the foregoing arrangement it will be seen that during the operation of the loom when the lay beats up, if the shuttle is in either of

the boxes, the corresponding binder will be thrown out, which so far depresses the protector as to pass under the protector-stop *q*; but if the shuttle fails to box as the lay beats up, the protector strikes against and pushes forward the protector-stop, which liberates the shipper, unclutches the loose pulley, and immediately after forces the brake *m* against the periphery of the fly-wheel to stop the loom instantly, which could not be done effectually if the belt itself had to be shifted from the fast to the loose pulley.

To the rod *v* of the protector is attached a wooden spring, *w*, which extends far enough back to be struck and forced down by
33 a pin, *x*, on the connecting-rod *z*, which forms the connection between the crank and the lay, so that as this pin continues to descend in its circuit, it increases the tension of the spring *w*, which, being on the rod *z*, forces the binders *u u*, as the shuttle is boxing, thus gradually increasing the resistance until the shuttle is brought to a state of rest, and then by the continued motion of the pin, the spring is liberated, relieving the shuttle from the pressure of the binders. In this way the binders may act on the shuttle as it is boxing, and this by a gradually increasing force. The spring *w* I prefer to make of ash wood, as I have found this kind of wood to be best adapted to the purpose.

The race-beam *a'* of the lay is made of wood, and between the shuttle-boxes the surface is plated with sheet-metal *b'*, turned down at both edges to form flanches; one in front, and the other let into the mortise which receives the reed. It is secured to the wood by screws in front, so that the upper surface is smooth, to avoid friction as much as possible. The turning of the edges of the sheet-metal to form the flanches gives stiffness, which adds greatly to the strength of the lay with little
34 weight. The shuttle-boxes *c' c'* are made of sheet-metal, also attached to the ends of the race-beam. The front edge *d'* is turned down to make a flanch in front; two other flanches, *e' e'*, being bent down to make the slot in which the picker-staff work, and the back edge *f'* to form the back guide for the shuttle. Thus formed, they are secured by screws and bolts to the race-beam, and to the upper ends of the swords of the lay where they project up above the race-beam. The shuttle-binders from the front of the boxes, except at the inner ends, which are provided with guide-plates *g' g'*, attached by bolts to the upper ends of the swords. The lay, just above the axis of vibration, extends out beyond the frame on each side to form two beds, *h' h'*, on which play the rockers, *i' i'*, of the shuttle-shafts *j' j'*. The curves of these rockers are segments of circles struck from the points *k' k'*, where the staffs strike the points of the shuttle, so that during the vibrations these points shall traverse along a line parallel with the surface of the race-beam. The rockers are formed with flanches on both sides to embrace the bed on which they rock.
35 Between each rocker and its bed there is interposed a leather strap *l'*, attached at the inner end to the bed, and at the outer end to the rocker; and as the staff is drawn outwards by a spring *m'*, attached to the end of the race-beam, and connected with the staff near its lower end by a strap *n'*, the tension of the spring always keeps the interposed strap *l'* tight. The treddle' *o' o'*, which are operated in the usual way, communicate motion to the pickers for driving the shuttle by means of straps *p' p'*, which pass over the inner end of the rockers, so that the rockers are kept on their beds by the flanches, back and front, by the straps of the treadles and by the interposed straps.

In this way the shuttle motions are communicated with the least friction, without noise, retaining the part which strikes the shuttle, during

the entire range of motion, alway' parallel with the race-beam; and the motion can be carried to the highest velocities without breaking.

The upper end of each picker-staff is cut at the front face, to which is fitted a piece of raw-hide s', and the two are then embraced and
36 bound together by a leather strap t', the two back edges of the staff being notched to hold the leather strap in place. In this way the raw-hide is firmly held in place, and pieces are prevented from breaking and flying off.

The temples made as represented at Figures 7 and 8, of full size, are to be secured in the usual manner to the frame, one on each side. The stationary jaw u' is lined with leather v', or vulcanized India rubber or any analagous substance, and the movable spring-jaw w' is made with teeth in the usual way, so that the selvidge of the fabric woven is griped between the teeth and the lining, by which it is held to the required tension without injury.

Having thus pointed out the principles or characteristics which distinguish my invention from all other things before known, and the mode of constructing, applying, and using the same, which I have essayed with success—

What I claim as my invention, and desire to secure by letters-patent, is—

1st. Connecting the rocker of each picker-staff, made and op-
37 erated substantially as specified, with the bed on which it rocks, by means of an interposed strap of leather or other flexible substance, attached at the inner end to the bed, and at the outer end to the rocker, substantially as and for the purpose specified.

2d. Forcing the shuttle-binders inwards against the shuttle while boxing by a gradually increasing force, by means of arms on a rocker provided with a spring, which is acted upon by a pin on the connecting-rod of the lay, substantially as described.

3d. Securing the raw-hide pickers to the inner face of the staffs by means of a leather strap, or the equivalent thereof, embracing and binding the two together substantially as described, to ensure the firm union, to resist the rapid blows, and to prevent pieces of raw-hide from breaking and flying, as set forth.

RENNSALAER REYNOLDS.

Witnesses:
CHAS. BAMBURGH.
WM. H. BISHOP.

(Here follow two diagrams.)

38 DEFENDANT'S EXHIBIT C.

GRAHAM & ROUSE
vs.
W. MASON.

The U. States Patent Office, to all persons to whom these presents shall come, greeting:

This is to certify that the annexed is a true copy from the records of this office of the letters-patent granted William Stearns, dated 5th July, 1859, No. 24668.

In testimony whereof I, T. C. Theaker, Commissioner of Patents, have caused the seal of the Patent-Office to be hereto affixed this eighteenth day of October, in the year of our Lord one thousand eight

hundred and sixty-seven, and of the Independence of the United States the ninety-second.

[SEAL.] T. C. THEAKER.

39 The United States of America, to all to whom these letters-patents shall come:

Whereas William Stearns, of Manchester, New Hampshire, has alleged that he has invented a new and useful improvement in the picker-motion for power-looms, which he states has not been known or used before his application, has made oath that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or discoverer of the said improvement, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the Treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents signifying a desire of obtaining an exclusive property in the said improve-provement, and praying that a patent be granted for that purpose:

These are, therefore, to grant, according to law, to the said
40 William Stearns, his heirs, administrators, or assigns, for the term of fourteen years from the fifth day of July, one thousand eight hundred and fifty-nine, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of the said William Stearns in the schedule hereto annexed, and is made part of these presents.

In testimony whereof I have caused these letters to be made patent, and the seal of the Patent-Office has been hereto affixed.

Given under my hand at the city Washington, this fifth day of July, in the year of our Lord one thousand eight hundred and fifty-nine, and of the Independence of the United States of America the eighty-fourth.

JACOB THOMPSON,
Secretary of the Interior.

Countersigned and sealed with the seal of the Patent-Office.

[L. S.] WM. D. BISHOP,
Commissioner of Patents.

41 No. 24668.

The schedule referred to in these letters-patent and making part of the same.

To all whom it may concern:

Be it known that I, William Stearns, of Manchester, in the county of Hillsborough, and State of New Hampshire, have invented a new, useful, and improved picker-motion for power-looms; and I do hereby declare that the same is described and represented in the following specifications and drawings:

To *make* others skilled in the art to make and use my invention, I will proceed to describe its construction and operation, referring to the drawings, in which the same letters indicate like parts in each of the figures.

Fig. 1 is a plan or top-view of the picker-motion;

Fig. 2 is an elevation of one side; and

Fig. 3, of the end of the same.

The nature of my improvement in picker-motions to power-looms consists in extending the picker-staff down through the rocker and rail on which the rocker works, so as to aid in holding the rocker in
42 its proper position on the rail, and in arranging and constructing the rocker to receive the picker-staff and permit it to be readily adjusted to remedy any defect in the staff rocker or rail; also, in a hook on the under side of the rocker to work through the rail and prevent the end of the picker-staff from rising above the rail when the loom is run fast.

And further, in making a stud for a coiled spring to work on, smaller in the middle than at the ends, so as to allow the spring to contract in diameter as it is drawn in working; lastly, in making that portion of the stud surrounded by the stationary end of the coiled spring permanent or stationary and that portion surrounded by the moving end of the spring to revolve, to facilitate the working of the spring.

In the accompanying drawing A is the hub or rail, of cast iron, made in the form shown in the drawing, or in such other form as will
43 answer the purpose, and perforated, as shown by the dotted lines B B, in Fig. 2, for the end of the rock-shaft of the lay of the loom, to which it is applied and fastened by the screw C, Fig. 1. The top of the rail A is level or flat, for the rocker D to work on, and it has a score or slat in it from the roller E, shown in dotted lines in Fig. 2, and which turns on the pin F. The hook G, and picker-staff H, both pass down through and work freely in this slat in the rail A.

The rocker D may be made in the form shown in the drawing, or in such other form as will answer the purpose; that is, its under side is curved, as shown in Fig. 2, and the arm I extends up from its top and is provided with a score for the shank of the hook G and for the picker-staff H, as shown by dotted lines in Fig. 2, both of which are fastened to the arm I by the bolt J and clip K, as shown in the drawings. The arm I is braced by the flange L, and the rocker D has a hole
44 through it, so that the hook G and picker-staff H both pass down through the rocker D and rail A, as shown by dotted lines in Fig. 2.

The upper end of the arm I is provided with a set-screw, M, which is made to act against the shank of the hook G, so that, by unscrewing the bolt J and screwing in the screw M the position of the picker-staff may be varied and adjusted, as desired, to operate the shuttle of the loom. The upper end of the picker-staff is drawn forward to throw the shuttle in the loom by a strap applied around or connected to the picker-staff above the rocker and arm I, and the picker-staff H is drawn back after it has thrown the shuttle by the leather strap N fastened to the staff by the clip K, and connected to the spiral spring P, as shown in the drawing.

The stand R projects from the back side of the rail A, and extends down to support the stud S, shown in Fig. 4, which is fastened to
45 it by the screw T, which passes through the stud and *and* screws into the stud S. This stud is made conical, as shown in the drawing, and has the notch U in it, (see Fig. 4,) which receives and holds the end of the spring P, which spring works on the stud S and on the collar V, which collar is arranged to turn on the end of the stud S, shown by dotted lines in Fig. 4. The end of the stud S, beyond the collar V, is made square to receive a wrench to turn the stud and draw spring P, to apply a proper draught on the strap N, and hold the stud, while the screw T is tightened to fasten it. The stud S and collar V

are made conical or tapering towards each other as shown in Fig. 4, so as to allow the coiled spring P to contract in diameter in the middle as it is drawn by the strap N.

Fig. 5 is a drawing of a rocker with the hook G cast on; but as the hook when cast on is somewhat liable to be broken off, I think
46 they are preferable when cast without the hook, which may be applied as shown in Fig. 2, the bolt J passing through it, and the set-screw M acting against it to adjust the picker-stick H. I so arrange the curve of the rocker that when the picker-staff is bolted to it without bearing upon the set-screw, that the staff will fall at the striking point of the shuttle; then, by loosening the bolt and applying the set-screw M, I can make the staff throw the shuttle straight or raise it as desired, which is often desirable in weaving, particularly if the rocker or rail should be worn away a little. There is great utility in making the staff adjustible in the rocker, as it enables the weaver to work a spring or imperfect stick or staff, or remedy any little defect in the rocker or rail which might, otherwise, subject him to great inconvenience. The hook at the end of the picker-staff prevents the
47 end of the staff from being drawn out of the score or slot in the rail, which is a very great advantage in looms that run fast. I believe I have described my invention and improvements in the picking-motion of looms so as to enable one skilled in the art to make and use it. I will now state what I desire to secure by letters-patent. I claim extending the picker-staff down through and below the rocker, and through the rail as described. I claim the rocker D, made to receive the staff in the way and manner described; and, in combination with the rocker D, I claim the hook G or G, whether made separate or cast on the rocker, for the purposes set forth.

I claim making the picker-staff adjustible in the rocker, in the manner described, or in some equivalent manner.

I claim making the stud surrounded by the coiled spring P smaller in the middle than at the ends, to allow the spring to contract in
48 diameter in the midde, as it is drawn in working.

I also claim making that portion of the stud surrounded by the stationary end of the coiled spring permanent or stationary, and that *the* portion surrounded by the moving end of the spring to revolve *or* facilitate the working of the spring.

WILLIAM STEARNS.

Witnesses:
GEO. BELL.
——— LILLEY.

[Here follows diagram, marked page 48.]

49 DEFENDANT'S EXHIBIT D.

The U. States Patent Office, to all persons to whom these presents shall come, greeting:

This is to certify that the annexed is a true copy from the records of this office of the letters-patent granted Benjamin Lapham, 20th January, 1838, an' No. 575.

In testimony whereof, I, A. M. Stout, acting Commissioner of Patents, have caused the seal of the Patent-Office to be hereunto affixed this eleventh day of October, in the year of our Lord one thousand eight hundred and sixty-seven, and of the Independence of the United States the ninety-second.

[SEAL.]

A. M. STOUT,
Act'g Com'r.

No. 575.

The United States of America, to all to whom these letters-patents shall come:

50 Whereas Benjamin Lapham, of Waterford, Saratoga Co., N. Y., has alleged that he has invented a new and useful improvement in the common & power loom, which he states has not been known or used before his application; has affirmed that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or discoverer of the said improvement, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the Treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose:

These are therefore to grant, according to law, to the said Benjamin Lapham, his heirs, administrators, or assigns, for the term of fourteen years from the twentieth day of January one thousand
51 eight hundred and thirty-eight, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of the said Benjamin Lapham, in the schedule hereto annexed, and is made part of these presents.

In testimony whereof I have caused these letters to be made patent, and the seal of the Patent-Office has been hereunto affixed.

Given under my hand at the city of Washington, this twentieth day of January, in the year of our Lord one thousand eight hundred and thirty-eight, and of the Independence of the United States of America the sixty-second.

JOHN FORSYTH,
Secretary of the Interior.

Countersigned and sealed with the seal of the Patent-Office.
[SEAL.] HENRY L. ELLSWORTH,
Commissioner of Patents.

52 The schedule referred to in these letters patent, and making part of the same.

To all whom it may concern:

Be it known that I, Benjamin Lapham, of Waterford, in the county of Saratoga and State of New York, have invented a new and useful improvement in the power and common loom. I do hereby declare that the following is a full and exact description thereof, reference being had to the drawings annexed. The nature of my invention consists in employing a spring to move the "wag-staff" in throwing the shuttle, and of dispensing with the ordinary "picker," "picker-strings," and "picker-rods" commonly used in the power-loom, which I effect by straining a spring gradually during a full revolution of the cam-shaft, by which the necessary force to throw the shuttle is acquired by an easy and uniform resistance to the driving power exerting that force, always certain, under any speed of the loom.

I do not deem it necessary to describe in detail all the parts of the common or power loom to point out this improvement. I have therefore only marked the parts in the drawings which are new,
53 and such other parts as are connected with them, which will be sufficiently clear and distinct to a person skilled in the art of building power-looms.

Description.

A & A, cam-shaft of ordinary speed, 1 to 2 of the crank-shaft.

B & B, transverse cams, having a regular and gradual inclination transversely the whole circumference of the cam. The cams are set upon the shaft so as to divide equally between both cams, alternately, a throw of the shuttle at a half revolution of the shaft.

C, spiral spring, made of No. 3 wire, (less or more,) and attached to the cam-levers D D, and containing the deposit of power when strained to throw the shuttle. D & D, cam-levers working against the cams B & B by the friction-rollers *a* & *a*.

E & E, wag-staffs, the upper ends of which pass through the center mortices in the bottom of the shuttle-box; upon the working side the shuttle is faced with raw-hide, or other hard substance. The lower ends or feet of the wag-staff describe a sweep or section of a circle of such form as to produce a horizontal movement to that part of the upper end of it which works against the shuttle. and is connected by a yoke, *b* & *b*, to the seat *c* & *c* affixed to the baseboard of the lathe.

F & F, leather strap (iron rods may be used with equal advantage) connecting the cam-levers with the wag-staffs. G, suspension-rods to sustain the cam levers D & D, working at the top by a joint on a stud thrown inwards five inches, or thereabouts, and attached to the upper rail of the loom.

H, baseboard of the lathe upon which the rocker of the wag-staff rests.

FIG. 2.—Supplementary drawing, a skeleton discription of two variations in the principle of action embraced in the declaration at the head of this discription, stating the nature and design of my invention, and involving the same principle with the above first-described method.

(Vis:) 1st. I & I *and* two strong springs fastened to the back parts of the frame of the loom K & K, and are connected with the cam-levers D & D by the connecting-rods J & J.

2nd. L & L are pulleys attached by stands to the inner or outer sides of the lower girt in the frame of the loom, to which the weights M & M are appended, & connected by the straps N & N to the cam-levers D & D.

In either case the spiral spring C is dispersed with.

The mode of operation will be instantly perceived by a person skilled in the art of weaving or of loom-building, & therefore does not require a particular explanation from me.

The traverse cams being a gradual incline during nearly a full revolution of the crank-shaft, they acquire the force to throw the shuttle with great uniformity of resistance to the driving power, and not suddenly exerted as is the case with the old & common method; & that force, as will be seen, will always be equal & the same under speed of the loom, when *when* the weight is raised or the springs strained.

What I claim as new, and desire to secure by letters-patent, is the manner of applying the principle of gradually accumulating a deposit of power to throw the shuttle, whether it be by the use of straining a spring, or by raising a weight as herein described.

And secondly, the particular device herein specified, taken and considered, as a combination of old methods to produce a new result.

BENJAMIN LAPHAM.

Witnesses:
J. CRAMER, 2d.
O. H. LEE.
A. G. BAILY.

Ex'd: A. T.

(Here follows diagram marked page 56.)

57 GRAHAM & ROUSE
vs.
WM. MASON.

DEFENDANT'S EXHIBIT E.—WM. H. BISHOP, *Notary Public.*

The United States Patent-Office to all persons to whom these presents shall come, greeting:

This is to certify that the annexed is a true copy from the records of this office of the letters-patent granted Daniel Barnum, dated 26th March, 1845, No. 3968.

In testimony whereof I, T. C. Theaker, Commissioner of Patents, have caused the seal of the Patent-Office to be hereunto affixed, this eighteenth day of October, in the year of our Lord one thousand eight hundred and sixty-seven, and of the Independence of the United States the ninety-second.

[SEAL.] J. C. THEAKER.

58 The United States of America to all to whom these letters-patent shall come:

Whereas Daniel Barnum, Bridgeport, Conn., has alleged that he has invented a new and useful improvements in the power-loom, which he states has not been known or used before his application, has made oath that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or discoverer of the said improvements, and that the same hath not, to the best of his knowledge and belief, been previously known or used; has paid into the Treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said improvements, and praying that a patent may be granted for that purpose.

These are, therefore, to grant according to law to the said Daniel Barnum, his heirs, administrators, or assigns, for the term of fourteen years from the twenty-sixth day of March one thousand eight hundred and forty-five, the full and exclusive right and liberty of making, constructing, using and vending to others to be used, the said improvements, a description whereof is given in the words of the said
59 Daniel Barnum in the schedule hereunto annexed, and is made part of these presents.

In testimony whereof I have caused these letters to be made patent and the seal of the Patent-Office has been hereunto affixed.

Given under my hand at the city of Washington this twenty-sixth day of March, in the year of our Lord one thousand eight hundred and forty-five, and of the Independence of the United States of America the sixty-ninth.

JAMES BUCHANAN,
Secretary of the Interior.

Countersigned and sealed with the seal of the Patent-Office.
HENRY L. ELLSWORTH,
Commissioner of Patents.

The schedule referred to in the letters-patent and making part of th
same.

To all whom it may concern:

Be it known that I, Daniel Barnum, of Bridgeport, in the county o
Fairfield, and State of Connecticut, have made certain new and usefu
improvements in the manner of arranging and combining the ap
paratus concerned in the arresting the momentum, and the throw
ing of the shuttle in the power-loom, and I do hereby declare tha
the following is a full and exact description thereof:

In the accompanying drawing, Fig. 1 is a front view of a part of
loom, showing the race-beam, the shuttle-boxes, the picker-staves, and th
wag-staves. Fig. 2 is a top view of one of the shuttle-boxes showing
spring which I attach to the protection-guard for the purpose of arres
ing the momentum of the shuttle, and the shuttle acting against sai
spring. A A are the picker-staves, which are each sustained on a rocke
B, to cause the motion of its upper end to be in a right line. C C are th
wag-staves, D D being the rods by which they are connected to th
picker-staves. E E are spiral springs by which the wag-staves are draw
back when relieved from the action of the treadles, leaving the shuttl
box free from the entrance of the shuttle, without the obstruction of
picker; the treadles are to be depressed by means of cams in the ordinar
way.

I do not employ any pickers in the shuttle-boxes, but the heads of th
picker-staves are capped with picker-leather or other suitable substanc
at their upper ends, which are brought directly into contact with th
shuttles.

To arrest the momentum of the shuttles, I attach an additional sprin
to the inside of the protection-guard, as shown at F, Fig. 2; an
when the shuttle comes into contact with the swell G of the gua
and forces it out, so as to act on the protection-spring F,
at the same time forced inwards, and arrests the shuttle so as to pr
vent its striking against the end of the box with such force as wou
cause it to rebound, for as the additional spring is on one side and th
swell of the protection on the other side of the fulcrum, the shuttle
pressed against the back of the box by the protection, and the rebound
ing is consequently effectually prevented.

By the manner of combining and operating the wag-staves, and picke
staves, and combining them with each other, and with the treadl
the friction of the apparatus is much less than under other constructio
there is greater certainty of the action of the shuttle, and the apparat
is rendered more durable than heretofore.

Having thus fully described the nature of my improvement in t
manner of arranging and combining the apparatus concerned in t
arresting of the momentum, and in the throwing of the shuttle, wh
I claim therein as new, and desire to secure by letters-patent, is the e
ployment of the spring F on the inside of the protection-guard in t
manner and for the purposes described. I also claim the p
ticular manner of combining the treadles, the wag-staves, and t
picker-staves with each other as herein described and represent
so that they shall co-operate in providing the required motion as
forth.

I do not claim as new the manner of forming the picker-staves wit
rocker on their lower ends, nor do I claim the using them with

the ordinary picker, this having been previously done, but limit my claim to the arrangement and combination above named.

DANIEL BARNUM.

Witnesses:
THOS. P. JONES.
WM. BISHOP.

(Here follows diagram marked page 62.)

63 Supreme Court of the United States.

WILLIAM MASON, APPELLANT,
vs.
EDMUND H. GRAHAM AND WANTON ROUSE. } No. 97.

Appeal from the circuit court of the United States for the district of Massachusetts.

UNITED STATES OF AMERICA,
Massachusetts District, ss:

I, John C. Stetson, clerk of the circuit court of the United States, first circuit, district of Massachusetts, certify that in the hearing of the cause of Edmund H. Graham et al., complainants, v. William Mason, defendant, in said circuit court, which said cause is now pending in the Supreme
64 Court of the United States on appeal, being numbered in said Supreme Court 97, the exhibits hereto annexed were used, namely:

Exhibit Rouse and Graham, N. A. P.
Defendant's Exhibit A.
" " B.
" " C.
" " D.
" " E.

And that these exhibits are now certified by me to be used at the hearing of said cause on appeal in said Supreme Court at the request of both parties to said cause.

Witness my hand and the seal of said circuit court, at Boston, in said district, this twenty-sixth day of October, A. D. 1874.

[SEAL.] JOHN G. STETSON, *Clerk.*

Supreme Court of the United States.

NO. 337.

WILLIAM MASON, APPELLANT,

vs.

EDMUND H. GRAHAM & WANTON ROUSE.

COMPLAINANTS' BRIEF AND ABSTRA[illegible]

BOSTON:
ROCKWELL & CHURCHILL, CITY PRINTERS,
122 WASHINGTON STREET.
1874.

SUPREME COURT OF THE UNITED STATES.

No. 337.

WILLIAM MASON, Appellant,

vs.

EDMUND H. GRAHAM AND WANTON ROUSE.

APPELLANT'S BRIEF AND ABSTRACT.

All references by pages are to the printed record in this Court.

ABSTRACT.

This is an appeal from a decree of the Circuit Court for the District of Massachusetts, adjudging that the respondents recover of this complainant "$3,329.40 as and for profits" made and received by this complainant from his infringement of the reissued patent of the respondents, "dated May 28, 1867, upon which this suit is founded, as reported by the Master in schedule A annexed to his report."

See decree, pp. 18 and 19.

This complainant filed exceptions to the Master's report, pp. 17 and 18.

The bill of respondents alleges that they have a reissued patent for a picker-staff motion, — a part of a loom for weaving, — and that the defendant infringed said patent.

The answer admits the making of picker staffs, but denies infringement.

1. This question of infringement is raised by the answer, and is to be passed upon.

The answer also denies novelty, but the issue of infringement will settle the question of novelty, as the evidence upon the question of novelty narrows the invention of the respondents and shows it not to have been infringed by the appellant.

The true construction of the patent may be gathered from an examination of the original, as well as the reissues, and thus in one form or the other the complainant will not be liable to answer anything other than the real invention of the respondent.

AS TO THE APPELLANT'S PROFITS.

2. The other questions relate mainly to the amount of profits of the complainant by the use of the defendant's invention (if he shall be held to have infringed), and are raised by the exceptions to the Master's report, pp. 17, 18, which report was approved by the Court, and upon it the decree was based, pp. 18, 19. These exceptions were overruled by the Court.

3. The other question raised — is by the last exception to the Master's report, p. 18 — for that the Master refused to allow in reduction of the appellant's profits the $1,000 paid, as appears by paper D, p. 17. The Court overruled this exception.

Upon this question of infringement the complainant submits the following considerations: —

STATE OF THE ART.

Before passing to the consideration of the reissued patent of May 28th, 1867, under which complainants claim, I pray the attention of the learned Court to the state of the art as put in evidence in the record.

In power looms there are two shuttle boxes, one on each side of what is termed the shuttle race, and in a line with it. The shuttle race is in front of what is termed the reed of the lay, through which the warp threads pass and by which the weft threads, after every passage of the shuttle, are beat or forced up to the required place between the warp threads. The reed, the shuttle race and the shuttle boxes are mounted in what is termed the lay, which is a frame hinged at its lower end to the main frame, and which receives a reciprocating

motion from cranks on the shaft to beat up the weft threads. As the shuttle is alternately driven from right to left — that is, alternately from one shuttle box into the other, — and as it has to travel in a straight line, it is important that the blows by which it is driven from side to side should be given in the line in which it is required to travel. Many years ago the shuttle was driven by what is termed "pickers," fitted to slide on rods or in ways in the shuttle boxes and parallel with the shuttle race, and each picker was connected by a cord with the upper end of a lever, termed a "picker staff," hinged by its lower end to the lay, so that by the vibrations of the picker staffs the required motions were imparted alternately to the pickers to drive the shuttle. The upper end of such picker staffs necessarily described arcs of circles, and hence it was necessary to interpose the pickers between them and the shuttle, to change the direction of the driving force from curved to straight lines. Such a mode of operation induced much friction, and in a very short time after the introduction of power looms it became apparent that the pickers could be dispensed with and much friction avoided if the upper end of the picker staffs could be made to travel in straight lines, so that the upper end of the staffs could act directly as pickers to strike the shuttle. This desired result was soon obtained by making the lower end of each picker staff in the form of a segment of a circle described from a centre located at that part of the upper end of the staff which was to act as the picker to strike the shuttle, the segment of a circle at the lower end of the staff forming a rocker to roll on a flat surface or bed parallel with the shuttle race, and placed one on each side of the loom and at the lower part of the lay. Various modes of connecting the rockers with the beds have been at various times applied and described in patents for improvements in looms. Examples of such rocking picker staffs and modes of connecting them with the bed, will be found described and represented in the following prior patents put in evidence on the part of the respondents, viz.: Patents Exhibits A, B, C, D and E, all of which are of a date prior to the alleged invention of the said Graham, and, one of them, the Lapham patent, Exhibit D, dated July 5th, 1838; another, the Barnum patent, Exhibit E, dated the 26th day of March, 1845; and another,

the Reynolds patent, dated June 1, 1852, Exhibit B. In all of these patents it is in terms, or by force of inference, admitted that rocking picker staffs were well known and used long prior to their dates of issue, no claim being made in either of said patents to this device or mode of operation.

The Lapham patent of Jan. 20th, 1838, Exhibit D.

There is no claim in this patent to the picker-staff motion, the patent having been granted for an arrangement of machinery for communicating the vibratory motion alternately to the two staffs. The patent, however, clearly represents what was then well known. On each side of the lower part of the lay and attached thereto is a flat bed on which there is a rocker in the form of a segment of a circle attached to, and which constitutes the lower end of the picker staff. This staff is caused to vibrate alternately in opposite directions by the tension of a spring in one direction, and by a cam in the opposite; and the rocker is connected with its bed so as to rock thereon by a link or strap jointed at one end to the side of the rocker and at the other end to the rocker. This jointed link or strap holds the rocker to its bed as it rocks thereon, but as every part of the rocker during the rocking motion rises from, and returns to the surface of the bed, it follows that the point of connection with the link or strap so moves up and down; and as the other end of the link or strap is jointed to the bed, and the connection between the bed and rocker is in a straight line, whatever may be the form of the link, so long as it is not flexible, and the rolling face of the rocker is the segment of a circle, it follows, from the law of such an organization, that the rocker in rocking on the bed must have a slight longitudinal sliding motion on its bed, the range of which will be at its minimum when the two joints of the link with the rocker and bed are nearest the surface of the bed and rocking surface of the rocker, and that the range on this sliding motion will be increased as these points of connection are placed further from the said surfaces. These are matters known to every constructor of machinery.

The drawings of this patent do not give an artistic representation of this mechanical arrangement — that is to say, they are not what

are termed working drawings. The drawings on which patents are granted are seldom, if ever, suitable for working drawings, and rarely, if ever, give the proportions. They are what the 6th section of the patent act of July 4th, 1836, requires, sufficient to enable a person skilled in the art to make and use the invention.

The location of the points of connection of the link with the rocker and bed, and the kind of joints, whether by long or short journals or pins, whether the journals shall be fast to the bed and rocker, and turn in the link, or be fast to the link and turn in suitable sockets in the bed and rocker, are matters which belong to the constructing machinist and not to the inventor, for these things require mechanical skill, and not ingenuity.

The Barnum patent of March 26, 1845, *Exhibit E.*

A certified copy of the model marked Exhibit E, from the patent office on which this patent was granted, was put in evidence. In this, as in the Lapham patent, the picker staff has a rocker which rocks on a bed, and through the rocker there is a mortice with vertical and parallel sides. A journal passes through this mortice, and secured to two ears or standards on the bed, one on each side of the rocker. In rocking, the mortice in the rocker slides on the journal, and as this journal must be above the surface of the bed, it follows that the rocker must have a slight longitudinal sliding motion on the bed, as in the Lapham patent.

In this, the tension of the spring usually employed for drawing back the picker staff, at all times keeps one of the surfaces of the mortice against the journal or pin which is the fulcrum on which the staff vibrates, the curved form of the rocker causing the point of bearing of the mortice on the fulcrum to shift during the vibration.

In this the wabbling of the staff is prevented by the bearing of the flat face of one side of the mortice against the fixed journal, whilst in the Lapham it is prevented by the length of the journal pins in the end of the link, and also by a flanch on one side of the bed extending up on one side of the rocker.

The Reynolds patent of June 14th, 1852, Exhibit B.

In the Reynolds patent, Exhibit B, the under face of the rocker is formed with two downward projecting flanches that extend down each side of the bed to prevent wabbling, and between the bed and the under surface of the rocker is interposed a flexible strap, which is attached by one end to one end of the rocker, and by the other to the opposite end of the bed. The mechanism by which the picker staff is operated always tends to keep the interposed strap distended. This arrangement is described in the patent as an improvement on picker-staff motions before known and used, and it is therein stated that in such prior picker-staff motions the rocker was connected with the bed, in some instances by a single link, or metal strap, as in the Lapham patent, Exhibit D, and in other instances by two links or metal straps, one on each side. But, as in all instances in which the rocker is connected with the bed by means of one or two links or straps, the rocker in rocking must slide on its bed to some extent, he sought to avoid this sliding motion by substituting the interposed flexible strap for a single or double link or strap.

It will be seen presently that the kind of picker-staff motions, represented by Exhibits H and I, which respondent has made since the date of complainants' second reissue patent, is but a slight variation in form of what is described in the Reynolds patent as the double-link picker-staff motion, and like Lapham's, merely duplicated, and that those made like Exhibit G, made by respondent prior to the reissue, are like the single-link rocker motion as described in the Lapham patent, and one of the kinds described in the Reynolds patent.

The Cheney patent of March 17, 1857, Exhibit A.

In this, as in the others, the picker staff has a rocker to rock on a bed, but the bed has a groove along its entire length, in which groove there is a cogged rack, and the surface of the rocker along its entire length and in the middle of its width has a row of cogs which match into the cogs in the bed. These cogs effectually prevent the rocker from sliding on its bed and prevent all wabbling; but, to prevent the cogs of the rocker from flying out of the teeth of the rack in the bed, a pin projecting from one of the staffs slides under a cam on the frame.

The Stearns patent of July 5, 1859, Exhibit C.

This has a rocker at the lower end of the picker staff, which rocks on the bed, but instead of one or two jointed links, as in the Lapham and Reynolds patent, there is a mortice in the middle of the bed in which is mounted a horizontal roller. From the under surface of the rocker of the staff, an arm about in line with the staff extends down through the mortice in the bed, and the face of this arm is held against the periphery of the roller in the mortice, so that in rocking the axis of the roller is the fulcrum of the staff, and the arm moves up and down in front of the roller, which turns on its journals to reduce the friction. As the axis is below the bed, it follows that the rocker must slide on the bed.

It will be noticed that this only differs from the Barnum patent in having the axis of vibration below instead of above the surface of the bed and in having a roller interposed between the journal or pin and the surface which bears against it, but the mode of operation in both is the same.

It will be noticed that the picker-staff motions known prior to Graham's, and which have been described, all rock on a bed; so that the part which strikes the shuttle shall travel in a straight line; and that as to the means by which the rocker is connected with the bed, they are divisible into three classes: —

First. The one found in the Lapham patent, and the two described in the Reynolds patent as known and used prior to his invention.

Second. Those described in the Barnum and the Stearns patent.

Third. The one described in the Reynolds patent as his invention, and the one described in the Cheney patent.

In the first class the rocker is connected by one or two links, straps, or radius bars, jointed at one end to the rocker and at the other to the bed, — the said connection having two axes of vibration; one at a point in the bed-piece, and necessarily at a considerable distance from the picker staff, the other axis moving in the arc of a circle of which the fixed axis in the bed is the centre.

Such is, beyond controversy, the mode of operation of the first class. The only friction due to this organization is that of the turning of the links or radius bars on their journals, and what is due to

the slight slipping of the rocker on its bed, which slip can be varied in degree by changing the points of location of the axes of the links, but cannot be wholly avoided.

In the second class the staff vibrates on a single axis, connected with the bed either above or below the plane of the bed, the rolling of the rocker on the bed, causing the staff to slide on the fixed axis of vibration. In this class there are two sources of sliding friction; the sliding of the staff on the axis of vibration, and the slip of the rocker on its bed.

And in the third class the rocker is retained in place during its rocking motion by a resistance which takes place at every point of contact of the rocker with the bed, as in the case of a wheel rolling on a surface on which it cannot slip; in the Reynolds patent this being effected by a leather strap which bends to the curvature of the rocker, and in the Cheney patent by the cogged racks.

The mode of operation of each of the three classes, as a means of connecting the rocker with the bed, is clearly distinguishable from the others.

The means of connecting the rocker with its bed, described in the reissued patent under which complainants claim, belongs to the second of the three classes above stated; and all those made by respondent belong to the first class.

The latest in date of the prior patents put in evidence on the part of the respondent is Exhibit C, granted to William Stearns, July 20th, 1859, fifteen months prior to Graham's patent, and no evidence was offered tending to prove that Graham made his alleged invention before the date of Stearns's patent.

From the testimony of Daniel Adams, it will be seen that at the time of making these alleged inventions, Stearns and Graham were employed in the same establishment, and the witness (Adams) did not begin to work on the first patterns for Graham's, until after Stearns's had been completed.

Questions 6 and 7, p. 47.

A comparison of Graham's with those that preceded it, and particularly with Stearns's, will establish that Graham sought to improve

the second class; and although the witness (Adams) states that he was instructed by Stearns not to let Graham see what he was making, the striking resemblance between the two suggests that the witness was not very successful in keeping Graham's eyes closed.

There is but one mode of construction described and represented in the reissued patent under which complainants claim. Like all its predecessors the picker staff has a rocker to rock on a bed, and, like the second class before specified, the staff vibrates on an axis connected with, and in a fixed position relatively to the bed, on which axis the picker staff slides up and down as the rocker rolls back and forth on the bed, to cause the picker end of the staff to travel in a straight line. As in the Barnum and the Stearns patent, the distance between the picker end of the staff (the part which strikes the shuttle) and the axis on which it vibrates is constantly changing as the rocker rolls on the bed, because the axis is in a fixed position relatively to the bed, while in the first class the axis of vibration is always at the same fixed distance from the picker end of the staff, and movable relatively to the bed.

Instead of having a mortice in the bed with a roller on a journal, and a projection from the under part of the rock, or prolongation of the picker staff, to bear against the roller, and to move up and down during the rocking motion, as in the Stearns patent, or instead of a vertical mortice in the rocker, to slide up and down on a horizontal fulcrum pin secured to two short standards on the bed, as in Barnum's, Graham has an axle fitted to turn in boxes in two standards on the bed, such as that in the Barnum patent, except that the boxes are open on an incline, so that the axle can be lifted out of them, and the axle can turn in the boxes. The rocker has a slot which is parallel with the staff, slides up and down on the axle, as the rocker rolls on the bed, precisely as the slot in the rocker slides on the fixed fulcrum pin in the Barnum patent, and as the projection below the rocker in the Stearns patent moves up and down against the roller. So far, it will be seen that the mode of operation in Graham's is identical with Barnum's and Stearns's, except that in the Stearns patent the friction due to this sliding motion is sought to be relieved by a friction roller on the fulcrum pin or axle; and although the axle

in Graham's can turn by reason of having its ends in the form of journals fitted to turn in boxes, and in Barnum's the fulcrum is a fixed pin, still so far as regards the sliding motion up and down as the rocker rolls, it makes no perceptible difference whether the axle turns or is fixed. It appears from the testimony of Daniel Adams that the objection to the Stearns plan when first introduced was the want of a sufficient bearing surface where the sliding on the fulcrum takes place; the amount of bearing surface was too small, and in consequence wore away very rapidly. Graham sought to remedy that defect by enlarging the bearing surface. To effect this he put a bar on the middle of, and at right angles to the axle, and fitted this bar to a socket in the rocker of, and in line with the staff, so that as the rocker rolled back and forth on the bed, the staff should slide up and down on this bar and axle, instead of on the axle alone; thereby presenting a much larger wearing surface than could be presented by a roller or fulcrum pin.

Such is the mechanism described and represented in the reissue of the Graham patent, when stripped of the high-sounding words in which it is clothed in the patent; and which might readily mislead persons not accustomed to analyze mechanical organizations. The bar on the axle to increase the wearing surface is termed in the patent "the "journal-bearing arm," terms which give the impression that the arm or bar supports the journal, while the reverse is the fact, as the journals carry the bar. In other parts of the patent it is termed a "shaft or bar." But, by whatever name, it is simply to increase the bearing surface, to prevent the too rapid wearing of the parts, and, if made of considerable length and fitted accurately to the socket which slides on it, will tend to guide the movements of the staff.

Having explained the state of the art and in what respects the mechanism described in the patent under which complainants claim, the next matter to be submitted to the consideration of the Court is —

THE LEGAL CONSTRUCTION OF THE CLAIMS OF THE REISSUED PATENT.

The specification of the reissued patent will be found Record, 19, 20.

There are three claims in this patent: —

1st, "The combination of a rocker of a picker staff with its bed by loose journals projecting each side of the picker staff and arranged beneath the picker staff, substantially as described."

It will be noted that this is not a claim to making a picker-staff motion with a rocker to rock on a bed. Such a claim would be void for want of novelty. In the declaratory part of the specification the patentees say: "In the devices commonly employed previous to the invention therein claimed for vibrating the picker staffs of looms, the rapid motion necessarily communicated to the picker staffs, in order to drive the shuttles with the requisite rapidity, soon causes a derangement and consequent wabbling of the parts, and necessitates frequent repairs, as it is essential that the motions of the picker staff should be accurate."

Record, bottom of p. 19.

Having thus pointed out the defects of the devices previously in use for this purpose, and in which may be seen the Stearns device, the patentees proceed in the next paragraph to state the object sought to be obtained by the alleged improvement. They say, "The object of the improvement herein claimed is to produce an accurate and sure motion for picker staffs" — (not by providing the lower end of the staff with a rocker to rock on a bed, but), "by a combination of devices, which, while giving accuracy of motion, so guides and holds the picker staff as to cause it to operate with the least possible friction and lateral disarrangement or wabbling."

The next inquiry is, what are the devices the combination of which is to produce this "great accuracy of motion," and which "so guides and holds the picker staff as to cause it to operate with the least possible friction and lateral disarrangement or wabbling?"

These devices, and the manner of their combination and mode of operation, will be found described in the next paragraph of the specification, as they have been herein pointed out. As it has been shown that the device by which the rocker is combined with its bed is the axle with its journals resting in boxes attached to the bed, which axle is provided with an arm fitted to socket in the rocker, so that it (the rocker) may slide up and down thereon, as it rolls on the bed, it fol-

lows that this *axle*, or what is termed in the patent the *journal-bearing arm*, is the device by which the rocker of the picker staff is combined with its bed, so that, in the language of the declaratory part of the specification, "while giving great accuracy of motion, so guides and holds the picker staff as to cause it to operate with the least possible friction and lateral derangement or wabbling."

In confirmation of the above condition, after describing the construction and arrangement of parts as above stated, the patentees say (near the top of page 20), "By this arrangement *the rocker*, in its reciprocating movement, *is kept perfectly true in its bearings by the arm or bar* (*g*) *which holds the rocker truly in the position, in consequence of its long bearing therein;* and as the arm or bar (*g*) also oscillates freely upon its journals (*h*, *h*,) which further serve to steady the rocker laterally, the rocker moves with the least possible friction, and with the greatest accuracy, so that the wear and tear is necessarily slight."

Having shown that, by the letter and spirit of the specification of the reissued patent, the arm (*g*) on which the rocker slides up and down are the devices and the only devices described in the patent, by which the rocker is combined with the bed on which it rocks, and that these are the devices by which, as stated, the required results are to be attained, and that there are no journals in any manner connected with the picker staff or its rocker, other than those projecting like trunnions from the bar or arm (*g*) which is fitted in a socket in the rocker, that it, the rocker, in rolling on the bed, may slide up and down on the said arm, the conclusion is irresistible, that the first claim to "the combination of a rocker of a picker staff with its bed by loose journals, projecting each side of the picker staff, and arranged beneath the picker staff substantially, as described," can only be construed to be a claim to the combination of the rocker of a picker staff with its bed by means of the arm (*g*) with its journals projecting each side of it, because the journals on the arm (*g*) are the only journals described in the specification and represented in the drawings, and they project each side of the picker staff, because they project from the arm or bar (*g*), the body of which is within the socket in the rocker of the picker staff; and the journals are "loose journals," because the rocker of the picker staff is hollow,

and slides up and down on the arm or bar (*g*) which carries the journals, so that they are loose relatively to the rocker, and stationary relatively to the bed.

To give any other construction to the claim would do violence to the letter as well as the spirit of the specification.

Under the construction of the first claim submitted, it will be contended, on the part of the respondent, that a picker-staff motion to be an infringement of this first claim must have an arm, or bar, or some device which in the combination performs the same duty substantially in the same way. It must be connected with the bed, so that in the rocking motion the rocker of the staff can slide up and down on it, and it must have a sufficient length of bearing to steady the staff in its rapid vibrations, because it is stated in the specification that, by "this arrangement the rocker (in its reciprocating movement) is kept perfectly true in its bearings by the arm or bar (*g*) which holds the rocker (*a*) truly in position, in consequence of its long bearing therein." Such is one of the special duties or functions assigned to it in the specification. And such device must have journals projecting from each side of it fitted to turn in boxes connected with the rocker, for such is the construction specified, and in defining the duties and functions of the devices by which the rocker of the picker staff is combined with its bed, it is further stated that, "as the arm or bar (*g*) also oscillates freely upon its journals, which further serve to steady the rocker laterally, the rocker moves with the least possible friction, and with the greatest accuracy, so that the wear and tear is necessarily very slight." By reference to the proofs it will be seen that no such devices have ever been used by the respondent to combine the rocker with its bed in any of the picker-staff motions which he has at any time made, sold or used.

Of the Second and Third Claims.

2d. "In combination with the rocker, the bed and the journals, the open boxes, substantially as and for the purpose described."

3d. "In combination with the rocker and its bed, the journal-bearing arm, operating substantially as and for the purpose specified."

The three claims, when carefully considered, indicate that the per-

son who drafted them understood the many figures which can be produced in the kaleidoscope from the self-same bits of colored glass by causing them to be presented in different positions within a polygonal tube of mirrors.

Each one of the three claims in succession relates to the manner of combining the rocker of the picker staff with its bed — the first by loose journals projecting each side of the picker staff, the second by the journals and the open boxes, and the third by the journal-bearing arm.

It is respectfully submitted that either the three claims are each in succession a mere repetition of the same combination, to be construed as above submitted with reference to the first claim, or that they are all void as claims to combinations of mechanical elements which have no connection, and are incapable of mechanical operation.

It has already been pointed out that to give legal consistency to the first claim "the combination of a rocker with its bed by *loose journals*" must be construed to include the journal-bearing arm (*g*) on which the rocker slides up and down, the said arm being provided with journals projecting from each side and fitted to turn in boxes connected with the bed on which the rocker rocks. Without all of these connections there could not be any mechanical action. The journals must have boxes to turn in, and these boxes must be attached to the bed. The journals cannot be immovably connected with the rocker because in rocking on the bed every part of the rocker in turn moves up and down, from and towards the bed; and, besides, they are named in the claim as *loose* journals, which clearly indicates that they are not to be *fast* relatively to the rocker. And as the journals are *fast* to the arm (*g*), which is termed in the patent "the journal-bearing arm," and the rocker is free to slide up and down on this journal-bearing arm, it follows that there can be no connection between the parts named in the first claim, and no mechanical operation, unless the journal-bearing arm with the boxes for the journals to work in be introduced in the claim in giving a legal construction to the terms "loose journals."

Then as to the combination in the second claim, which is to the combination of the bed, the journals and the open boxes with the

rocker. This combination is either a worthless abstraction, incapable of mechanical action, or the arm (*g*) on which the rocker slides up and down must be added to the "journals" by legal construction; and in view of such a construction the second claim will be for the same combination as the first claim. That the journal-bearing arm must be introduced in this combination to produce a combination capable of producing mechanical action must be obvious, as without this the journals would have to be attached directly to the rocker, which, as already shown, would thereby be prevented from rocking, and if not attached directly to the rocker the journals would roll out of the open boxes every time the rockers rolled in the direction of the inclination of the boxes. It is because the journal-bearing arm is at a considerable angle to the line of inclination of the open boxes that the journals do not roll out of the boxes. Hence any claim to a combination in which the open boxes are one of the elements must have the journal-bearing arm introduced in it, or the claim would be a worthless combination, incapable of mechanical action.

Then, as to the third claim, which is to the combination of the journal-bearing arm with the rocker and its bed. Unless by legal construction the journals be added to the "journal-bearing arm," and the boxes for the journals to work in be added to the "bed," it must be obvious that the combination named would have no legal consistency, as there would be no connection of the parts, and hence no mechanical action.

The journal-bearing arm is the key to the construction of the patent.

What kind of journal-bearing arm is it?

It is an arm which slides in a hollow place in the rocker as the rocker moves up and down on the bed. It slides in and out of this hole or hollow, thus lengthening and shortening the picker staff after the fashion of a telescope.

This is the arm which has journals which fit into the open boxes beneath it.

All the claims refer to the mechanism "as substantially described," and there is no other device substantially described.

The original patent, p. 21, near the bottom, says: "The shank *ee*,

into which extends vertically a shaft or bar, *gg*, *which shaft* or bar, *gg*, by means of shaft journals, *hh*, has a bearing on the eyes, *ii*, formed in the bed piece, *cc*.

This shaft arm was intended to serve another purpose than merely to enable the rocker to move up and down upon it. The reissue says, "By this arrangement the rocker, in its reciprocating movement, is kept perfectly true in its bearings by the arm or bar, *gg*, wich holds the rocker, *aa*, truly in its *position in consequence of its long bearings* therein."

P. 20, near the top.

In this combination of devices the journal-bearing arm is the most prominent. It is the only new thing, unless it may be the open boxes, described (and open boxes are common, every loom is full of them). Take out this peculiar arm, and the open boxes described would prevent the *rockers from moving at all*.

True it appears that the proof of the existence of any journal or box bearing arms before the plaintiffs' patent, limits their patent to the specific kind of arm that necessarily limits the claim of open boxes to the open boxes as described, and the combination to the combination of specific devices.

If the plaintiffs were in fact the inventors of the first picker-staff motion wherein the rocker was held to the bed by journals, as was found in the case *vs.* Mason, the result would be different, perhaps. But in view of the state of the art, his patent must be limited to his specific combination. Let us look a little at the different working of the plaintiffs' patent and Mason's Bridle motion.

1st. What is the office of the journals?

A. They, by being pressed snugly into the boxes, keep the journal-bearing arm so that it cannot move except backward and forward in a given line.

2d. What in said patent causes the rocker and picker staff to move correctly and prevents wabbling, for the bottom of the rocker and the bed are both plane surfaces?

A. The arm inside of the hollow of the rocker "by means of its long bearings therein." At least, so says the patent.

In fact, however, this is not true, because the arm is cylindrical,

and the hollow in the rocker is a cylinder, and there is nothing in the means described to prevent the rocker from turning around and around in the arm, and it has to depend on other things not designed for the purpose for its very imperfect operation.

INFRINGEMENT.

The question of infringement is determined by the construction of the patent, as there is no pretence that the link of the complainant entered into the rocker or picker staff.

We will, however, examine somewhat the testimony of the experts: —

On the part of complainants a picker-staff motion was produced and marked Exhibit 3, N. A. P., Examiner, purporting to be one of a class made by respondent, but in the middle of p. 66 of the record will be found a stipulation to the effect that it was made by Wanton Rouse, one of the complainants, and that Exhibit G is a correct representation of that class of picker-staff motions made prior to the reissue of the Graham patent by respondent.

Mr. Sleeper, complainants' expert, testified that Exhibit No. 3 was substantially the same as the mechanism in complainants' reissued patent, because he said the journals extended each side of the picker staff. (P. 26, question 19.) Mr. Sleeper was not examined as to Exhibit G, but Mr. Rouse, one of the complainants, was on cross-examination, and he had to admit that in Exhibit No. 3 the picker staff is between the two ends of the bearing surface of the journals, — that is, the journals project each side of the picker staff, and that in Exhibit G they project only on one side of the picker staff, so that Exhibit G does not come within Mr. Sleeper's definition of an infringement of the reissued patent.

But the testimony of Mr. Rouse goes further. He was compelled to admit that this difference between Exhibits G and No. 3 is only a difference in degree, and not in principle or mode of operation.

Cross-questions 38 to the end, pp. 45, 46.

That Exhibit G is essentially different from the invention described in complainants' reissue, and that it is substantially like the Lapham

patent, is clearly proved by Mr. H. B. Renwick, who gives conclusive reasons in support of his opinion.

Record, pp. 55, 56.

The theory on which Mr. Sleeper bases his opinion that the respondent's picker-staff motions infringe complainants' reissued patent, is that the journal-bearing arm has journals projecting on each side of it, and that that is the means by which the rocker is combined with the bed; that the journals projecting each side of this arm or bar are *loose journals*, because they are "not fast to the rocker or the bed, but upon a separate piece;" that it is impossible to connect the journals directly with the rocker and its boxes directly with the bed, or *vice versa*, and that one or the other must be indirectly connected—that it is for that reason that in the patent the journals are placed on the arm, upon which the rocker can play up or down;" that in Exhibit No. 2, which is the same as Exhibits H and I, he finds the rocker combined with its bed by loose journals, and their boxes operating in substantially the same manner as in the mechanism described in the patent. The journals extend each side of the picker staff and are arranged beneath the picker staff substantially as in the patent.

He finds that the links in Exhibit No. 2 is the equivalent of the journal-bearing arm, because its two sides bear the journals, connect the rocker with its bed by means of journals and their boxes, allow the rocking motion of the rocker, and prevent wabbling, in substantially the same manner as the mechanism in the patent.

Record, pp. 25, 26.

This method of proving the substantial identity of two pieces of mechanism by the results produced will hardly stand the test of law, and if applied to test the validity of complainants' patent by what is described in the prior patents put in evidence by respondent after Mr. Sleeper's first examination, no better evidence would be needed to void the patent. As, for instance, he defines as the equivalent of the journal-bearing arm a link, one end of which extends around the picker staff, and the other fitted to a notch in one end of the bed,

and having two axes of vibration, one at a fixed point at the end of the bed, and the other at a fixed point in the rocker, so that the axis of vibration of the staff shall be always at the same distance from the picker at the upper end of the staff, and always moving in a curved line from and towards the bed, whilst the journal-bearing arm has but one axis of vibration, and that at a fixed point on the bed, and on which the staff vibrates, the arm and staff having the same axis of vibration, which remains stationary with reference to the bed, and at a constantly changing distance from the picker at the upper end of the staff.

The legal definition of mechanical equivalents in mechanical combinations is that they must do the same duty in substantially the same way.

With a view to show that the link in Exhibits H and I is the equivalent of the journal-bearing arm (*g*) of complainants' reissued patent, Exhibit 8 was produced. In this it will be seen that the rocker is jointed to two parallel bars, fitted to slide vertically in ways attached to the sides of the bed.

Mr. Sleeper, in answer to questions 18 and 19 (Record, pp. 35, 36), testifies that this Exhibit No. 8 is precisely like Exhibits No. 2 and H, "in every respect except one, viz., the arrangement of the journal-bearing arm."

If this be true then it would follow logically that the journal-bearing arm of complainants' patent is substantially identical with the two links or metal straps for connecting the rocker with the bed, as described in the prior Reynolds patent, which conclusion would void the patent for want of novelty in the things patented.

Mr. Renwick's testimony as to this Exhibit No. 8 will be found in his answer to Inter. 17, p. 67, Cross-inter. 57, p. 69.

Mr. Renwick has given conclusive reasons why Exhibits H and I are substantially different from the mechanism described as the invention of Graham in the reissued patent, and why the said exhibits are like the picker-staff motions described in the Reynolds patent as known and used prior to his invention.

Pp. 57, 58, 59.

And that the means by which the rocker and bed are combined in complainants' revised patent is but a slight modification of what is described in the Barnum patent, Exhibit E, and in the Stearns patent, Exhibit C.

The resemblance was so striking between the picker-staff motions made by respondent, Exhibits H and I, and those described in the Lapham and Reynolds patent, that on the part of the complainants it became a necessity to attack both of the said patents on the grounds of defects in the mechanism and insufficiency of description.

The Lapham patent was attacked on the ground that the connecting link or radius bar is pivoted to the rocker so high, and to the bed so low, that it would cause considerable slip of the rocker on the bed. And the Reynolds patent was attacked on the ground that the description therein given of the previously known motions are not sufficient to be understood by persons of skill.

Mr. C. F. Sleeper is the person on whose testimony, as an expert, the complainants rely for supporting this point.

And, first, as to what he says of the Lapham patent.

After pointing out what he deems to be resemblances and differences between Lapham's and the combinations specified in the three claims of complainants' reissued patent, at the end of his answer to the third question in chief (p. 26), he expresses the embarrassment he was under, in this labored analysis, by reason of the impossibility of comparing two mechanisms without "considering them as practically operative for producing some practical result; and, accordingly" (he says) "I have been obliged to do violence to my conviction that Lapham's mechanism, as described in his patent, is practically inoperative, and not at all adapted to produce the required result for which it was designed."

As we have here an expert of an extremely susceptible nature, it may be well to inquire into the extent of the violence which he inflicted on his sensibilities in testifying as he did on this subject. It may be that the effort and the violence of the pain which he inflicted on himself was in a great measure due to the want of experience. It will appear from his answer to the second direct interrogatory (p. 23), in which he defined the extent of his knowledge on

the subject on which he was called to instruct the conscience of the Court, that for seventeen years he had been in the habit of making mechanical drawings, and for a year and a half making comparisons of machinery as to their similarities or differences in the course of his profession as a solicitor of patents. Now Mr. Renwick, educated as an engineer, for many years extensively engaged in the practice of his profession, for several years a chief examiner of patents in the patent office, and for the past fifteen years called as an expert in the most important patent causes, says, at Ans. 6, p. 56, that, with the exception of perfection of workmanship, and slight differences in proportion, the mechanism described in the Lapham patent is in all respects identical with Exhibit G, which exhibit is one of the very picker-staff motions made and sold in large quantities by respondent before the date of the last reissue of complainants' patent. And I have shown that Exhibit G is substantially identical with the picker-staff motions which are made and sold by Rouse, one of the complainants, under complainants' patent.

The witness admits, in answer to question fourth (Ans. 4, p. 28) that the drawing of the Lapham patent is evidently incorrect, and yet he condemns the mechanism because of these very inaccuracies. Drawings in patents are not required to be what machinists call working drawings, but merely sufficient, aided by the specification, to enable a person skilled in the art to make and use the invention.

6th Sec. Patent Act of 1836.

As proved by Mr. Renwick, the connection of a rocker with a bed by one radius bar or link or two, one on one side, was at the time of the grant of the patent to Lapham, a well-known mechanical device, known and used in other machines requiring such a motion.

Latter part of Ans. 6 and 7, pp. 56, 57.

All that was necessary to be said or represented to a machinist was to have a rocker at the lower end of the picker staff, and connected with a bed by means of a link or radius bar, or one such on each side, and the machinist would know how to make it as well as he would know how to make and connect a cog wheel and pinion.

In all the picker-staff motions referred to in the proofs, except Reynolds' improvement and the Cheney patent, the rocker in rolling has a slight sliding motion on the bed, and the object of Reynolds' improvement was to avoid this longitudinal sliding motion; and in referring to the picker-staff motions known and used prior to this invention, Reynolds says, in the specification of his patent: "The rocker was connected with, and kept on its bed on the lay, by one or two jointed links or metallic straps, jointed at one end to the rocker and at the other to the bed, which necessarily caused the rocker at every vibration to slide on its bed."

Ans. 7, p. 57, Mr. Renwick testifies that that is a sufficient description to enable a skilful mechanic, without invention, to construct one, and at the bottom of p. 56 he gives the reason why. And as it must be evident, if such be the fact, that the complainants have no case, Mr. Sleeper was resorted to to exercise his ingenuity in attempts to show that the passage in Reynolds' specification, as above quoted, means no such thing. He says, in answer to question 16, p. 34, that the passage in question is ambiguous, and may mean different things, and that he is "utterly unable to understand which of these things is meant. For instance, the term '*jointed link*' conveys to me the idea of a link of two pieces joined together, and the mechanism described, taking this to be the true meaning, would be such as that shown in the drawings now produced and marked Sleeper's, 11 and 12, where the rocker is connected with the bed by *two jointed links*. These jointed links are also jointed metallic straps, and are jointed at one end to the rocker and at the other to the bed; they would also cause the rocker to slide on the bed, and would not admit of very rapid motion."

I have quoted the very words of the witness, that the absurdity of his position may be the more apparent. Reynolds clearly refers to two modes of connecting the rocker with the bed, one is by one jointed link or metallic strap jointed at one end of the rocker, and at the other to the bed; and the other is by two jointed links or metallic straps jointed at one end to the rocker and at the other to the bed. It is submitted that no other meaning than that submitted by Mr. Renwick can be given to the passage in question by any one seeking the truth.

But this witness says that the term "jointed link" conveys to him the idea of a link of two pieces jointed together, and on that wild fancy produces two diagrams, in each of which there are two pairs of links or straps. In one of them, Diagram No. 11, each pair consisting of two links or straps jointed to each other by one end, and their other ends jointed one to the rocker and the other to the same end of the bed, and one such pair at each end of the rocker and bed.

And in the other diagram the two pairs of links or straps are jointed together, forming a sort of parallelogram, and two of the joints are in turn jointed, one to the middle of the bed, and the other to the middle of the rocker, and the other two joints left at liberty to be or go anywhere.

These two absurdities were briefly disposed of by Mr. Renwick in his answer to question 16, p. 67.

A chain is made of many links, each link being one piece of the chain, but our Sleeper would have each link made of many parts.

Not satisfied with the two absurdities represented in the two diagrams, Nos. 11 and 12, he produced a model, Exhibit 9, and says in answer to the same question (same page), "Or Reynolds may have meant to describe a motion in which two of Lapham's straps are used, jointed to the ends of the rocker instead of to the middle, — shown roughly in the model produced, Exhibit No. 9, — which would answer his description exactly in every respect except one, namely, the rocker would not slide on its bed."

It will be noted that the witness, to make out Exhibit No. 9, as well as Diagrams Nos. 11 and 12, was compelled to travel entirely out of the description given in the Reynolds patent. The leading purpose of the witness was to prove that the two links were not to be arranged one on each side of the rocker and bed. And why was that his purpose? Because, in trying to make it out that the respondent had infringed, he was forced to the alternative of trying to prove that the open link, one end of which surrounds the lower part of the picker-staff socket, and the other, in a hook-shaped cavity in one end of the bed, is the equivalent of a journal-bearing arm with a journal protecting on each side of it. If Reynolds described a con-

struction which consists of two parallel links or straps, one on each side of the rocker and bed, and both jointed at one end to the rocker, and the other to the bed, as it is clearly proved by Mr. Renwick that he does, the witness, Sleeper, must have seen that if the Court came to that conclusion, it would also, by force of logic, conclude that if respondent does infringe, Graham is not the original and first inventor of what is claimed in the reissued patent. It was this pressure of the facts which led the witness, Sleeper, to exercise his ingenuity in contriving something different. Reynolds says, where he refers to two links, "The rocker was connected with, and kept on to its bed by two jointed links or metallic straps jointed," not at opposite ends, but "at *one* end to the rocker, and at the other to the bed, which necessarily caused the rocker at every vibration to slide on its bed." Clear and distinct as this language is, the witness produces a model, Exhibit 9, with two links or metallic straps, and to avoid placing one on each side of the rocker and bed, he was compelled to ignore the terms, "*jointed at one end to the rocker, and at the other to the bed,*" and instead jointed them at opposite ends of the rocker, and at opposite ends of the bed. But that is not all. The closing terms of that part of the Reynolds patent are, "which evidently caused the rocker at every vibration to slide on its bed." This result cannot be avoided if the two links or straps are jointed at one end to the bed and at the other to the rocker; nor can it be avoided in respondent's, but Mr. Sleeper was forced to admit that as the links are arranged in Exhibit 9, the rocker 103 will not slip on its bed.

Bottom of p. 34.

Mr. Renwick has demonstrated that this Exhibit 9 will not work at all.

From what is said in complainants' reissued patent and in the testimony of Mr. Sleeper, the Court might be inclined to believe that the picker-staff motion possesses great merit. Such is not the fact.

Geo. Draper, who has been for several years engaged in visiting the factories to introduce the Stearns picker-staff motion, has no recollection of having seen any in use on the plan described in com-

plainants' reissued patent. He has seen some like Exhibit L, claimed to be made under complainants' patents by one of the complainants, W. Rouse.

This Exhibit L is like Exhibit No. 3 first produced by complainants as one of respondent's make.

It appears that Wanton Rouse got up this form of picker-staff motion and intended to apply for a patent for it, but was persuaded that he could not obtain one, or that, if he did, it would infringe upon the Graham patent, and as it was better than Graham's, they entered into an agreement by which Rouse, without paying anything for it, became owner of one-half of the Graham patent, and thereupon the patent was reissued, to gather within its folds all other picker-staff motions. This state of facts will be found in the testimony of Wanton Rouse, one of the complainants, who also testifies that his own picker-staff motion, Exhibit L and Exhibit No. 3, is better than the Graham, and that the best of all are Exhibits H and I, made by respondent.

PROFITS.

As to the questions relating to the amount of profits received by the appellant.

A.

Picker-staff motions form but a small part of a loom. A loom cannot work by power without something of the kind, and picker staves, apart from their use in looms, are valueless. They are integral parts of looms; yet, like others of the numerous parts of looms, are patented separately. The fact that they are patented separately does not, however, alter their character or the uses to which only they can be put. They remain still integral parts of looms. The appellant therefore claims that as these picker staves are parts of looms and integral therewith, this class of patents is to be treated as patents for improvements in looms, which they really are, for the loom is the unit.

The Master, pp. 13, 14, 15, says that 3,639 pairs of bridle motions were sold on and as parts of looms; "that the profits resulting from the manufacture of said motions so sold have mingled with the profits resulting from the manufacture of said looms."

He also finds that if these motions are to have only their own share of the profits — as their cost bears to the whole loom — the profit would be $8\frac{6}{10}$ cents per pair, or for the 3,639 looms $312.95, instead of $1,819.50, a difference of $1,496.55.

This rule is a favorable one for the respondent, because there are many kinds of picker staves that might be used.

Any other rule, as has been frequently adjudged, would work great wrong. Suppose the like rule should be applied to the different parts of the loom, the appellant might be required to pay much more than all his profits, and yet the law requires of him only his profits.

It is clear that the patentees in either of the patents introduced in evidence by the appellant might claim that the appellant infringed his patent.

For instance, it is a clear infringement of the Barnum patent.

Also of Reynolds patent. Reynolds' strap fulfilled the same function with Mason's bridle. It holds the roller to the bed and permits it to oscillate in the same way, and prevents it from slipping in the wrong direction.

B.

The same exception and the Master's report, pp. 17, 14, show the bridle or infringing motion to have been made by appellant "after a pattern of his own devising," that they "were made under a patent granted to him, and they cost about fifty cents less than the picker-staff motions made by the plaintiffs; the difference in the cost of manufacture being due to the appellant's invention."

Thus the fact is that the appellant invents a new picker-staff motion which cheapens his own production fifty cents per pair, the same amount that it cheapens the production below the respondent's production, and for this cheapening of production he has a patent of the United States, and yet was adjudged to pay the respondent the entire result of his own ingenuity, skill and labor.

It is now contended that this decision cannot be sustained. It gives to the respondent what the Master in direct terms finds to belong to the appellant.

When the Master comes to deal with motions sold separately from looms he charges the complainant with $451.26 profits on 414 pairs,

or $1.04 per pair, and with $263.00 profits on 297½ pairs, or *eighty-nine* cents per pair, instead of *fifty cents*.

When he deals with parts he charges him with profits for beds $63.24 cents, and for rockers $37.25 cents, upwards of a dollar for each motion, or two dollars per pair.

See Record, p. 15.

The double-link motions are out of the case, as the respondent did not appeal from the disallowance of that claim.

The Master, in his finding of the appellant's profits, followed no uniform rule.

He charges when sold as parts of looms fifty cents per pair, because he had made others at a greater cost by fifty cents — though his actual gross profits were $8\frac{6}{10}$ cents—disregarding his actual gross profits. And on those sold apart from looms, and as parts of motions, he charges complainant with the gross profits.

The complainant cannot be charged with more than his gross profits, by which is meant all his profits, irrespective of his own inventions.

His entire profits would be as follows: —

On 3,639 pairs sold on looms, @ $8\frac{6}{10}$ cents .	$312 95
On 414 pairs, separately from looms . .	451 26
On 279½ " " " " . .	263 00
On 346 beds	218 89
On 1,548 rockers	576 75
In all,	$1,822 85

In no case can there be more than the gross profits charged; therefore the charge for pairs sold on looms cannot exceed	$212 95
Nor can the charge for the 711½ be greater than 50 cents each, as other picker staves could be made for that difference without infringing	355 75
346 beds and rockers, *i. e.* pairs at 50 cents per pair	173 00
1,202, the balance of the rockers at gross profits of 37 cents each	444 74
The profits cannot exceed	$1,186 44

by any method of computation upon the findings of the Master.

But the Master finds (top of p. 14) that the picker staves were made fifty cents cheaper than the respondent's picker staves, and the same amount cheaper than those before that made by himself; that they were made under a patent granted to himself; and that "the difference in the cost of manufacture was due to his invention."

It follows that he received no profits from the use of the respondent's patent.

That is the measure of his liability to the respondent.

Mowry *vs.* Whitney.
Cowing *vs.* Rumsey, 8 Blatch., 39.
Livingston *vs.* Woodworth, 15 How., 544.
Serrell *vs.* Collins, 1 Fish, 289.

In Livingston *vs.* Woodworth it was distinctly held that the right of the plaintiff's recovery was limited to the profit the defendant actually did realize.

It is also contended that the items of profits, on parts of motions to repair motions already entered into the Master's account, should not be charged; they became like repairs upon machines sold, and freed from the monopoly of the patent.

A patent for a small part of a large machine is to be treated as a patent for an improvement in the machine, and its repair and restoration is the repair of the loom itself.

No difference in this respect can be attained by patenting parts of machine from patents for improvement in machines.

The patent is for a combination, and is not infringed by the sale of parts separately. There is no pretence of collusion with the users of the looms. They, no doubt, when parts of motions were broken, sent for similar parts to repair the loss. Simply sending a part thus ordered is surely no infringement of the patent for the combination.

The items for beds and rockers sold separately ought to be disallowed.

As to the $1,000 paid on agreement of Oct. 25, 1869, p. 17, question as to same raised by the last exception to the Master's report, p. 18.

The Master and the Court refused to allow the appellant any benefit whatever from this payment.

Said agreement is as follows: —

BOSTON, Oct. 25, 1869.

Received of Wm. Mason, of Taunton, one thousand dollars ($1,000) in full satisfaction of our right to collect back damages for the past infringement of reissued letters patent of May 28, 1867, for picker-staff motion by individuals and corporations who have used bridle motions of Mr. Mason's make, and as tariff for the future use of such motions. It is understood and agreed that the number of these motions does not exceed 5,451, and that Mr. Mason is to furnish us with a list of the names of the users; and that the bridle motions enumerated in that list are hereby licensed. This bridle motion is the motion patented by Mr. Mason. It is also understood and agreed that this settlement does not affect in any manner our right to recover profits or damages from Mr. Mason; and that the suit of Graham et al. *vs.* Mason shall proceed precisely as if this settlement had never been made. It is also understood that this agreement relates solely and simply to the bridle motion, and no other, and licenses simply those bridle motions of Mr. Mason's make not already licensed, and no others.

(Signed,) WANTON ROUSE,
E. H. GRAHAM,
By J. E. MAYNADIER,
WM. MASON.

The 5,451 motions licensed by this agreement, passed outside of the monopoly of the patent.

Howe et al. *vs.* Woodredge et al., 12 Allen, 18.
Wilson *vs.* Rousseau, 4 How., 684, 686.
Simpson *vs.* Wilson, 4 How., 709.
Bloomer *vs.* McQueenan, 14 How., 539.
Chaffee *vs.* Boston Belting Co., 22 How., 222, 223.
Thomas *vs.* Hunt, 17 C. B. (N. S.) 183.

In Howe & al. *vs.* Woodredge & al., the action was upon a contract whereby the defendants promised to pay the plaintiffs a certain sum "*for each and every sewing machine of every name and nature whatsoever that shall be hereafter made, used or sold*" by them during

the continuance of the contract; but the Court ruled that this provision, so broad and strong, could not be held to apply to machines bought by the defendants of other licensees, though such other licensees did not pay any royalty.

The provision that the payment should not affect this suit is not inconsistent with this view of the case, as it could go on to test the respondent's rights, and to recover for other infringements.

But if the provisions are repugnant, the money was paid, and the motions licensed, and the payment and license must prevail.

There is another and perhaps the true view, in which there is no repugnance or inconsistency.

When Mr. Mason paid the $1,000, the payment was a $1,000 added to the cost of the motions, and must be deducted from the profits.

The payment lessened his profits by so much.

The Master finds, towards the bottom of p. 14, "that the defendant paid the money named in this paper to protect the purchasers of said motions from suit, and that he agreed to protect them from all claims of patentees *when they purchased from him.*"

Now, it will not be contended, if Mr. Mason had upon this agreement paid this thousand dollars before suit brought, that said payment would not have lessened his profits. Does the fact that the payment was subsequent to the bringing of the suit change the result? Not at all, because the liability always existed, and the Master was to ascertain the profits to a time beyond said payment.

The price at which the looms sold was greater because of the agreement to indemnify against all claims of patentees, and thus the respondents suffer nothing by this construction.

J. G. ABBOTT,
Counsel for Appellant.

Supreme Court of the United States.

No. 377.

WILLIAM MASON, *APPELLANT,*

VS.

EDMUND H. GRAHAM AND WANTON ROUSE.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE DISTRICT OF MASSACHUSETTS.

BRIEF ON BEHALF OF APPELLEES.

BOSTON:
1874.

Circuit Court of the United States.

No. 377.

WILLIAM MASON, APPELLANT.

vs.

EDMUND H. GRAHAM AND WANTON ROUSE.

Appeal from the Circuit Court of the United States for the District of Massachusetts.

BRIEF ON BEHALF OF APPELLEES.

The thing in controversy is what is called a "Picker Staff Motion:" the picker staff being that part of a loom which is thrown forward violently so that its upper end shall strike one end of the shuttle and thus drive it from one side of the loom to the other; the motion being the mechanism which causes that part of the picker staff which strikes the end of the shuttle to move in a straight line. Both the motions here concerned are of the kind called rocker motions; taking their name from the fact that both are based upon the principle that the centre of a circle rocked upon a plane will move in a line parallel to that plane: in these rocker motions the arc of the rocker is struck from that point of the staff which strikes the shuttle, the plane upon which the rocker rocks is formed upon the bed of the motion, and the whole

motion is so secured in the loom that the plane of the bed will be parallel to the line to be travelled by that point of the staff which strikes the shuttle.

The mechanism is extremely simple, consisting of the staff and the rocker, which are rigidly connected together, the bed upon which the rocker rocks, and means for keeping the rocker on the bed. The main question here in controversy relates solely to the means for keeping the rocker upon the bed; both the rocker and the bed being old.

There are but two questions in this case: First—Are the means described in the appellee's patent (pp. 19–21) for keeping the rocker upon its bed new with Graham? Second—Are these means found in the motion made by appellant?

The answers to these questions depend almost wholly upon the mechanical facts, which are clear from inspection; and the Court below has decided that the facts, in view of the elementary and well settled principles of law, applicable to this class of cases, necessitate that both questions shall be answered in the affirmative.

NOVELTY.

As to the first question:

Graham connected the rocker to the bed by means of journals whose boxes were fast to the bed; these journals were fast to an arm, and the arm was in a slot in the rocker.

As a matter of fact he was the first to make a practically operative rocker motion in which the rocker and bed were connected together by means of journals and journal boxes, substantially as described in his patent.

The appellant denies that this is a fact; and refers to Lapham's patent exhibit D; to a paragraph in the description annexed to Rey-

nold's patent exhibit B; to Barnum's patent exhibit E, and Stearns' patent exhibit C, as sustaining his denial.

It is clear that the motions shown in these patents differ from Graham's in many respects; these differences are fully discussed in the opinion of the Court below, as appears from the following extract from that opinion:

"Reference is first made by the respondent to the patent of Benjamin Lapham, as supporting the defence that the improvement in question was known and used prior to the alleged invention of the complainant, but it is evident that the two are substantially different in the most essential features of the improvement. Lapham's invention has a bed and a rocker, and they are combined by means of a journal projecting from each, but the respective journals project only from one side instead of projecting from both sides, as in the complainant's device. Besides, the journals in the former are much shorter than in the latter, and the arm is farther from a horizontal plane. These differences are palpable and substantial, and show that the defence of want of novelty in the complainants' patent is not sustained by anything contained in the Lapham patent. Strong doubts are entertained whether the Lapham invention is operative for any practical purpose; but it is unnecessary to express any decided opinion upon that point, as it is clear that the two inventions are substantially different in their characteristic features.

"Next patent introduced by the respondent is that of Daniel Barnum, which was for an improvement in power looms. Like the patent first examined, it had a bed and a rocker, but it has neither journals nor boxes, nor a journal-bearing, nor box-bearing arm. Instead of journals, it has a pin projecting from each side of the picker-staff; but it does not turn, and cannot, in any legal sense, be regarded as a substitute for the loose journals in the complainants' invention.

"Stearns' patent, which is the next one to be considered, is substantially the same as that of Barnum, except that he has provided a friction roller to prevent the wear of the pin; but the rocker may move without the roller. The pin cannot properly be considered a journal; while the friction of the rocker upon the roller is greater than the friction of the roller upon the pin, the latter, to a certain extent, may perform the office of a journal, but the proofs tend to show that the reverse is true

after a short use of the mechanism. Properly considered, it has no journals, open boxes, nor a journal-bearing arm, and consequently lacks one of the elements of each of the respective combinations in the patent on which the suit is founded.

"Extended remarks in respect to the patent of Rensselear Reynolds is unnecessary, as he connected the rocker and the bed by means of a strap, one end of which was attached to the under face of the rocker, and the other in the groove of the bed-piece in which the rocker plays when the mechanism is in motion. Reynolds' patent also contains a suggestion supposed to embrace the complainants' invention, but it is too ambiguous to be reliable, and if it were less so, it would be insufficient to support the issue presented by the respondent, as there is no proof that any such device was ever made before the original letters patent were granted in this case."

The testimony abundantly supports these conclusions:

Sleeper 12–3, p. 25; 3–9, pp. 27–31; 13, pp. 32–3; 15–7, pp. 33–5.
Rouse ints. 3–10, pp. 37–9; 14–21, pp. 39–41; 26, p. 41.

The affidavits of Dutcher, Scott and Draper [pp. 8–12] constitute no ground for a re-hearing:

Dutcher speaks from a recollection of nearly thirty years; he is wholly uncorroborated; his recollection is not refreshed in any way; and he does not produce even a fragment of any of the contrivances about which he testifies; on the other hand he shows clearly that *all* he did was "to test the matter," and that the result was that he abandoned all his experiments, and patented a wholly different motion.

Scott is in a measure corroborated by Draper; but he is controlled by the letters of October 7th, 1859, and October 11th, 1859, which show that the motion could not have been practically operative, and was in fact abandoned.

Draper testified as an expert for the appellant, and his deposition was used on the hearing; it is printed on pp. 50–4; he did not speak of the Scott motion in this deposition, and it is clear that he then had

no recollection of it. Appellant had precisely the same facilities before the hearing as after it for ascertaining all that Dutcher, Scott and Draper knew.

These affidavits are, in reality, in corroboration of Rouse's testimony that "there was very little use of the rocker motions, excepting the Empire, until the Drapers' began to manufacture Stearns'. The rocker and bed is an old motion, but there seems to be a difficulty in providing a way to hold the rocker in its position practically; and as far as my knowledge extends, the rocker motion was laid aside or given up, except what little use the Empire made of it, until the Stearns motion came up, which took the place of the Perry and had a great run." (Bottom of page 37.)

INFRINGEMENT.

As to the second question:

Considered generally it is not disputed that appellant's motion is *precisely* like that described in appellees' patent in these respects, viz: (1) Each consists of three main parts or pieces—the rocker, the bed, and a third piece whose office it is to hold the rocker properly upon the bed; (2) the rocker and the bed are the same in each.

The only other question then is—Whether this third piece in appellant's motion is the substantial equivalent of the third piece in the re-issue.

On this question the Court below says: "Practically the only question in the case as to infringement is, whether the model exhibited in the proofs as representing the picker-staff motions made and sold by the respondent, is substantially the same, or substantially different, from the mechanism described and claimed by the complainants in their re-issued patent, as the respondent concedes that he has made and sold picker-staff motions, so called, corresponding with that exhibit. Doubtless the main purpose of the mechanism described in the re-issued patent was to compel that part of the picker-staff which strikes the shuttle to move in the required plane without wabbling or lateral oscillation; and it is obvious that the device made

and sold by the respondent was constructed to accomplish the same purpose in substantially the same way. Attempt is made to show that the means employed are substantially different, but the Court is not able to concur in that proposition.

"On the contrary, we find that the mechanism of the respondent's device is substantially the same as that described in the specification of the re-issued patent, and we are unable to see that the mode of operation is different in any material respect. Some of the elements of the device are different in form, but they are not new, and it is clear that they perform the same function as the corresponding parts do in the complainants' device. Both devices have a curved rocker, in which the picker-staff is fastened, and both have a horizontal bed, having a socket through which the shaft of the loom passes in the usual way. In both, the shank of the rocker is made hollow to receive the shaft-arm, and the rocker plays upon the horizontal bed, and the rocker is combined with the bed by loose journals, different in form, but performing the same function in substantially the same way. Arranged as they are beneath the picker-staff and each side of the shank, into which the picker-staff is inserted, they prevent the staff from wabbling in the same way and as effectually as the journals described in the complainants' patent. But the respondent denies that the device made and sold by him contained loose journals, or that he employs such means to combine the curved rocker and the horizontal bed. He admits that he employs the rocker and a bed, and that they are connected or combined; but he insists that he does not employ loose journals to accomplish that purpose.

"Supported as the theory is by the testimony of a learned and experienced witness, it has received the attentive consideration of the Court, but in our opinion it cannot be sustained; as it is clear that the combination is the same as that described in the complainant's specifications; and the particular device in question, although different in form, yet performs the same function as the device employed in the complainants' invention. Infringement depends not so much upon the form of the particular device in question, or upon the name given to it in the specification or by the constructor, as upon the functions it performs; and it is well settled law that if one device is employed in a similar combination as another, and performs the same function in the same way, the two are substantially the same, although they may be different in form, and may be known among mechanics by different names.

Much of the difference of opinion between the expert witnesses may be explained by the proper application of this principle; and without pursuing the subject further, suffice it to say that by a careful comparison of the exhibits one with another, aided by the proofs in the case, our conclusion is that the charge of infringement is sustained, and that the complainants are entitled to an interlocutory degree for an account and an injunction."

The testimony is also full and clear as to this.

Sleeper, ints. 14–8, p. 25; 20–3, p. 26; 7–13, pp. 30–2; 18, pp. 35–6.

Mr. Renwick bases his opinion as to the question of infringement upon a certain construction of the patent ["description and specification;"] namely, that "it is limited to two journals * * * each of which is at the same time *stationary with respect to the bed*, and loose [movable?] with respect to the rocker." (Int. 5, near bottom of p. 55.)

But this seems to be a wholly unwarranted limitation; (see Sleeper, int. 12, p. 32;) and Mr. Renwick himself admits as much when he admits that exhibit 8 is the same in substance as appellees' motion; (cross-ints. 57–9, pp. 69-70;) for in exhibit 8 the journal is *stationary* with respect to the rocker, and movable with respect to the bed; precisely as in appellant's motion, except that it moves in the arc of a circle in the latter, and in a straight line in exhibit 8.

There is in fact but one difference of any practical importance between the appellant's motion and that patented by the appellees, that difference is in the *manner of attaching the journal-bearing arm*. In the appellant's motion this arm is attached by means of a second journal which is a better way than by means of a slide or slot, as in appellees' motion. See Sleeper, ints. 13, pp. 32–3; 18, pp. 35–6.

MASTER'S REPORT.

This report is printed on pages 13–7. It appears that the appellant sold 414 pairs of motions at a profit of $451.26, or at a profit of $1.09 per pair; also that he sold 297½ other pairs at a profit of $263, or at a profit of 88c. per pair; also that he made a profit of over 63c. for each bed, and over 37c. for each rocker;—this would make the profit on a pair over $2. It is clear, therefore, that the appellant received not less than 88c. per pair profit, and often over $2 profit per pair when he sold motions apart from looms.

It appears that the appellant sold 3639 pairs of motions—each pair being on a loom.

It was proved on behalf of the appellees that "the general selling price" of motions per pair was $2,—that the cost was 91 cents per pair; and it was urged before the Master that on these facts the appellees were entitled to recover $1.09 per pair on each pair, as to which it did not appear from the evidence that the profit was in fact more or less.

It did appear as to sundry motions (amounting in the whole to 297 1-2 pairs) that they were sold at prices varying from the general selling price; as to these the Master properly reported the actual profit as it appeared from the evidence; and so as to the parts of motions sold.

But as to the great bulk of motions sold, viz: 3,639 pairs, there is no evidence showing affirmatively that they were sold for less than "the general selling price." The profit actually made on any one pair of these 3,639 pairs, "mingled with" the profit resulting from the manufacture of the loom on which that pair was sold; but does this show that this pair was sold for less than "the general selling price, $2 per pair?" When the appellees had established by proper evidence that "the general selling price" was two dollars per pair, was it not a just legal inference that these 3,639 pairs were sold at this price, until the contrary appeared? It is certain that the contrary nowhere appears,—there is no evidence even *tending* to show it,—unless it is to be inferred from the fact that these 3,639 pairs were "sold on looms," and that the profits from their sale "have mingled with the profits" from the sale of the looms.

The appellees do *not* contend that it follows conclusively from proof that the general selling price was two dollars per pair, and that the cost was ninety-one cents per pair; that the profits on these 3,639 pairs amounted to $1.09 per pair: But they do respectfully submit that on these facts, uncontrolled,—(and they submit that the fact that these motions were sold on looms, etc., does not in any way control these facts,)—the correct conclusion is that each of these 3,639 pairs was sold at the general selling price; and consequently that the profit on each was $1.09. It will be observed that the actual cost and actual selling price appear as to all the motions mentioned in Schedule A, except these 3,639 pairs.

The appellees excepted to the Master's Report for the reasons above given; see p. 18.

As to appellant's exceptions to the Master's Report:

The first and second exceptions appear to be the same in substance, viz: that the Master should have found that the profits on the motions sold upon looms were in the same proportion to the profits on the whole loom, as the cost of the whole loom was to the cost of the pair of motions; but there was no evidence whatever offered by appellant to sustain any such proposition; and moreover it did appear that the motions were made under a patent granted to appellant, and did not appear that any other part of the loom was patented; it also appeared that whenever the appellant sold any one of these motions, or any part of any one, for a definite price, his profits were never less than ten times 8 6-10 cents; these facts all tend strongly to show that the proportion between cost and profit in the motions was largely in excess of the proportion between cost and profit on the rest of the loom.

The third exception (last paragraph on p. 17) is based upon the assumption that the appellant could have sold motions "which he had immediately previous [to his infringement] put upon his looms," (second paragraph, p. 14,) at the same price at which he sold the 414 bridle motions; which assumption is without warrant. It is also clear that the Master's Report as to the profits on these 414 motions is a *necessary* conclusion of fact, from the facts found by him; and that this exception is simply to this conclusion of fact.

The fourth exception (first paragraph on page 18) is based upon the same unwarranted assumption; and also upon the strange doctrine that an infringer is not accountable to the patentee for parts of infringing machines "sold for the purpose of repairing or restoring" other infringing machines.

The fifth exception (second paragraph on page 18) asserts that "the Master erred in finding and reporting that the plaintiff is entitled to any profits whatever." The reasons for this assertion are, (1) that the infringing motions cost fifty cents less than those formerly made by appellant, and also (2) fifty cents less than those made by the plaintiffs, [viz: Exhibit No. 3 and Exhibit C; see agreement of counsel, page 66;] (3) "the difference in the cost of manufacture being due to the defendant's invention:" But these reasons do not even *tend* to show that the appellant made no profit.

It is possible that this exception was intended as an exception to the Master's finding of fifty cents per pair on the 3,639 pairs sold on loom; but it is clear that it is not such an exception; the first and second exceptions cover this point. Giving the utmost effect to the finding of the Master, that the fifty cents difference in cost was "due to the defendant's invention," it means nothing more than that the difference between the cost of Exhibit No. 3 and Exhibit No. 2 is due to the defendant's alterations; as to this see agreement of counsel on p 66, and int. 5 on p. 38. The Master did not, of course, mean to assert that the open boxes in this combination was the invention of the defendant; as this would have been in direct contradiction of the decree under which the Master was acting. The fact that appellant used "a pattern of his own devising," and that it cost him fifty cents less to manufacture motions after this pattern than after the pattern of Exhibit No. 3, (which is the kind that both plaintiff and defendant were making when appellant commenced to manufacture those called "bridle-motions" in the Master's Report), can have no tendency whatever to show that appellant made no profits whatever; nor that the Master erred in finding that appellant had made a profit of not less than fifty cents per pair on all motions sold on looms.

The last exception (third paragraph on page 18) relates to the Master's refusal to deduct the $1000 paid by appellant, acting not for himself, but for certain users who had been or were to be sued by reason of their infringement as *users*. The facts appear so clearly in the Master's Report, (p. 14, 3d paragraph from the bottom,) and from Schedule D, p. 17, that this exception does not seem to require argument.

Respectfully submitted by

J. E. MAYNADIER,

Solicitor and of Counsel for Appellees.

Ambler
vs
Whipple

Petition for re-
hearing for
original case
see 20th Wall. 546
for transcript
see Vol. 209.